University of Greenwich
Department of Law

Evaluating Biosecurity Law and Regulation in Developing Countries: case studies from Belize

Opi Maryse Outwaite

A thesis submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy of the University of Greenwich

September 2006

DECLARATION

I certify that this work has not been accepted in substance for any degree, and is not concurrently being submitted for any degree other than that of Doctor of Philosophy being studied at the University of Greenwich. I also declare that this work is the result of my own investigations except where otherwise identified by references and that I have not plagiarised another's work.

Opi Outhwaite (candidiate)

Dr. Robert Black (first supervisor)

ACKNOWLEDGEMENTS

First and foremost I would like to express sincere gratitude to my principal supervisors Dr. Robert Black and Mrs. Angela Laycock who undoubtedly made an unbeatable team in providing me support and supervision. My thanks to you for the numerous ways in which you have helped and encouraged me over the years. Thanks also to Dr. Nandini Dasgupta for her inputs.

I would like to thank everybody in Belize who contributed, in one way or another, to this thesis. Sincere thanks to the staff of the Belize Agricultural Health Authority and the Belize Pesticides Control Board for their assistance in facilitating fieldwork.

My thanks also to everybody in the Department of Law for your encouragement and friendship. Thanks especially to Lynne Hanmore—my moving into your office was a surprise for us both but I can say that, for my part, I do not think it could have worked out better.

Finally, to the friends and family whom I have forced to live the PhD experience with me, thank-you for your patience and support.

ABSTRACT

Biosecurity is the term used to refer to the management of risks to human, animal and plant health and safety from cross-border movement of living organisms and goods. The implementation of national legal and regulatory frameworks for Biosecurity will be affected by the various international agreements and standards to which a state is a member. In particular, agreements introduced by the World Trade Organisation (WTO) impose certain restrictions on measures that member countries can adopt for Biosecurity. Furthermore, uncertainties arise from contradictions and conflicts between important Multilateral Environmental Agreements and WTO requirements and these create difficulties for developing countries in particular.

The research reported in this thesis focused primarily on the implementation of national Biosecurity frameworks in this context. This was an important departure from much of the literature, in which existing work as well as the identified need for research has focused on apparent conflicts at the international level. The present research sought not to pursue strict hypotheses but to identify the actual challenges and limitations, as well as successes, of Biosecurity frameworks in Belize. The methodology adopted to achieve this was grounded theory. Key characteristics of this were a departure from the traditional legal-centralist approach and the investigation issues at the ground level, through consultation with a broad range of stakeholders. The adaptation of qualitative data analysis procedures, and the application of these using specialist software, was a further important development, allowing for improved evaluation of the interview data.

The investigation of Belize's pesticides control and agricultural health frameworks provided substantial empirical data highlighting not only the difficulties concerning implementation of international agreements but also to a range of other important issues. Whereas the burden associated with international agreements was clearly a restraint, the apparent conflicts and tensions between trade and environment agreements, which have been the focus of so much literature, were not seen to be significant. The extent to which the regulatory authority interacts with the regulated community was, however, seen to be an important influence on the success of both frameworks, affecting levels of stakeholder awareness and support for regulation. Enforcement is also important. Although sanction-based enforcement might not commonly be necessary there is a need for a clear distinction between enforcement and other (assistance-based) activities. Other bodies ('third parties') including regulatory agencies, private sector bodies and regional institutions play an important role, either official or *de facto,* in these frameworks. Governance was also an issue for the regulatory authorities. The implications of these findings for future research are discussed.

CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF DIAGRAMS

ACRONYMS AND ABBREVIATIONS

AB	[WTO] Appellate Body
BAHA Act	Belize Agricultural Health Authority Act 1999
BAHA	Belize Agricultural Health Authority
CAQDAS	Computer Assisted Qualitative Data Analysis Software
CARDI	Caribbean Agricultural Research and Development Institute
CARICOM	Caribbean Community
Cartagena Protocol/ Biosafety Protocol	Cartagena Protocol on Biosafety
CBD	Convention on Biological Diversity
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973
Codex	Codex Alimentarius Commission
CoP	Code of Practice
CTE	[WTO] Committee on Trade and Environment
DEFRA	[UK] Department for Environment, Food and Rural Affairs
DoE	Department of Environment
EC Treaty	Treaty Establishing the European Community
EC	European Community
EU	European Union
FAO	United Nations Food and Agricultural Organisation
GATT	General Agreement on Tariffs and Trade (1994, as revised)
GM	Genetically Modified
GMOs	Genetically Modified Organisms
GMPs	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Points

IDB	Inter-American Development Bank
IICA	Inter-American Institute for Cooperation on Agriculture
IPPC	International Plant Protection Convention
ISPM	International Standards for Phytosanitary Measures
IUCN	International Union for Conservation of Nature and Natural Resources
IVC	International Veterinary Certificate
KWIC	Key Word in Context
LMOs	Living Modified Organisms
MEAs	Multilateral Environmental Agreements
Minister	Minister for Agriculture, Belize (unless otherwise specified)
MoA	Ministry of Agriculture (Belize)
MOU	Memorandum of Understanding
MRL	Maximum Residue Limit
NGO	Non-governmental Organisation
NPPO	National Plant Protection Organisation
OIE	Office International des Epizooties (World Animal Health Organisation)
OIRSA	Organismo Internacional Regional de Sanidad Agropecuaria (Regional International Organization for Plant Protection and Animal Health)
PAHO	Pan-American Health Organisation
PCA	Pesticides Control Act 1985
PCB	Pesticides Control Board
PFA	Pest Free Area
PPE	Personal Protective Equipments
PPMs	Process and Production Methods
SI	Statutory Instrument

SPS	[WTO] Agreement on the Application of Sanitary and Phytosanitary Measures
TAHC	[OIE] Terrestrial Animal Health Code
TBT	[WTO] Agreement on Technical Barriers to Trade
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
US FDA	United States [of America] Food and Drugs Administration
USA	United States of America
USDA	United States [of America] Department of Agriculture
WTO DSU	WTO Dispute Settlement Understanding
WTO	World Trade Organisation

Chapter One: Issues in Biosecurity Law and Regulation

In this chapter the issues related to Biosecurity regulation and the implementation of national Biosecurity frameworks are reviewed. The overall discussion focuses on these issues with respect to developing countries. The first section provides an introduction to Biosecurity and examines its nature, scope and importance. The second section considers the extent to which Biosecurity is influenced by the existing international legal framework (section 1.2). Following this the difficulties arising with respect to potential conflicts between trade and environment agreements are discussed (section 1.3). These 'trade versus environment' debates have been the focus of a considerable amount of literature and are relevant to Biosecurity to varying degrees. Section 1.4 considers Biosecurity frameworks in more detail and reviews some of the controls and measures that may be adopted by states in seeking to manage risks to human, animal and plant health. These measures are reviewed in the context of relevant international standards. Issues related to implementation of national Biosecurity frameworks are then discussed (section 1.5). These issues include the implementation burden associated with national Biosecurity frameworks, including compliance with international obligations, the need for effective national enforcement mechanisms and the particular implementation issues facing developing countries. Finally, the ways in which the issues identified in previous sections might be addressed, through further research, are discussed. This provides the background to the preliminary identification of research needs which led to this thesis.

1.1 INTRODUCTION TO BIOSECURITY

1.1.1 What is Biosecurity and why is it important?

Biosecurity is a relatively new concept and the term is not yet used in a uniform manner nor is it subject to a strict definition. To date the United Nations Food and Agriculture Organisation (the FAO) is the only international organisation that has explicitly addressed the meaning and scope of the term Biosecurity.[1] Though the use of the term is increasing it has been uncommon for organisations or discussion to refer specifically to Biosecurity. In the first real attempt to address what Biosecurity is, at the international level, the FAO considered the use of this term

[1] This has mainly been through the FAO Committee on Agriculture Discussion Paper, 'Biosecurity in Food and Agriculture', Item 9 of the Provisional Agenda, Seventeenth Session, Rome, 31 March–4 April 2003, COAG/2003/9 and the FAO Technical Consultation on Biological Risk Management in Food and Agriculture, Final Report of the Technical Consultation, Bangkok, 13–17 January 2003 TC/BRM/Rep, as well as the incorporation of Biosecurity as one of FAO's sixteen 'Priority Areas for Inter-Disciplinary Action'.

and stated that "*Biosecurity is composed of three sectors, namely food safety, plant health and life, and animal life and health. These sectors include food production in relation to food safety, the introduction of plant pests, animal pests and diseases, and zoonoses, the introduction and release of Genetically Modified Organisms (GMOs) and their products, and the introduction and safe management of invasive alien species and genotypes*"[2]. For the purposes of this study the term 'Biosecurity' will be used in a manner that is consistent with the FAO definition and will refer to all of the underlying frameworks that are used to manage and assess risks associated with human, animal and plant health and safety and the establishment of regulatory systems in these areas, including environmental protection measures generally. The term will not be used to include the risks associated with Bioterrorism.

Biosecurity, therefore, refers to measures and frameworks for managing and regulating risks to human, animal and plant health and the environment. These measures are numerous and many of the issues are cross-cutting. For example, risks to human health will include the management and regulation of food safety systems; these in turn include issues of pesticide regulation, and the use of GMOs[3] (see later at 1.1.2).

Biosecurity is also concerned with environmental protection generally. It would be impossible to separate the elements of Biosecurity from each other. Prevention of the introduction of plant diseases and regulation of plant health is a measure of plant protection. For example, its specific purpose may be to protect important crops. However, these measures will necessarily impact on the general conservation of the environment since the introduction of plant diseases could have far reaching effects in terms of habitats and biodiversity. Likewise, general

---

[2] FAO, Committee on Agriculture, Biosecurity in Food and Agriculture, Item 8 of the Provisional Agenda, Sixteenth Session, Rome, 26–30 March 2001 COAG/01/8

[3] The Cartagena Protocol applies to 'Living Modified Organisms' and does not use the term 'GMO'. 'LMOs' are defined as "any living organism that possesses a novel combination of genetic material obtained through the use of modern biotechnology" (Cartagena Protocol, Art. 3(g)). The term 'GMO' is more common, however, and the terms are used interchangeably used in the present case. See Falkner, Robert, 'Regulating biotech trade: the Cartagena Protocol on Biosafety', *International Affairs* 76, 2 (2000): 299–313. See p.307.

environmental measures may have a direct impact on Biosecurity health and safety measures. For example, the use of protected areas or other similar conservation measures also has its part to play in ensuring the protection of plant health. This was recognised at a United Nations Environment Programme (UNEP) Conference of the Parties to the Convention on Biological Diversity, in which it was noted that "*Habitat protection... represents the major means undertaken worldwide for the conservation of species* in situ"[4]. Indeed, Dr. Robert Black has noted that "*protecting the 'environment' from damage...is first and foremost about protecting plants, either cultivated or wild*"[5]. Clearly the scope of Biosecurity involves more than the protection of plants and environmental protection. Generally the latter has been recognised as a legitimate goal in itself, but this point illustrates the relationship between the two elements of Biosecurity i.e. health and safety frameworks and general environmental protection.

1.1.2 The scope of Biosecurity and the need for regulation

Clearly the scope of Biosecurity is wide. The FAO definition refers specifically to measures "*applied in food and agricultural regulatory systems*"[6] but as indicated above the regulation and management of Biosecurity may extend further into measures applied for conservation purposes. The FAO notes, "*In some countries, Biosecurity programmes are expanding to include natural ecosystems*"[7]. It is submitted that in pursuing effective management and regulation of Biosecurity, it is now essential for states to recognise the importance, to Biosecurity frameworks, of environmental protection measures as well as measures relevant to agriculture and food safety.

The FAO notes three main needs for Biosecurity measures:

> "*i. To protect agricultural production systems and those dependent on these systems: Producers and others dependent on agriculture can see their livelihood destroyed by animal and plant pests and disease or*

---

[4] United Nations Environment Programme (UNEP), 'Global Strategy for Plant Conservation', Conference of the Parties to the Convention on Biological Diversity, Sixth meeting, The Hague, 7–19 April 2002.
[5] Black, R., 'The legal basis for control of imports of animal and plant material into the United Kingdom', *Environmental Law Review*, 5 (2003): 179–192. p.181.
[6] FAO, Rome, 2003, op cit., para. 2.
[7] FAO, Rome, 2003, ibid.

damage to the environment such as impacts resulting from invasive alien species;
ii. To protect human health and consumer confidence in agricultural products: Biosecurity measures are essential to protect consumers— particularly vulnerable groups— that can be exposed to severe health risks, which Biosecurity attempts to prevent;
iii. To protect the environment and promote sustainable production: Public awareness of environmental issues and human dependency on biodiversity has resulted in numerous commitments to achieving sustainable development, and achieving these will require an effective approach to Biosecurity."[8]

The FAO notes that issues in Biosecurity are traditionally dealt with in a sectorial manner, "*by means of food safety laws, and animal and plant quarantine and pesticide regulations*"[9]. This has been the traditional approach to Biosecurity and is reflected in both international and national regulatory frameworks. Almost all states deal with Biosecurity in a sectorial fashion at the national level[10], with different frameworks in place for plant health and quarantine, food safety, conservation, animal health and quarantine and so on. However, the regulatory and management systems for sectorial frameworks are costly. This is because there are often recurrent costs in terms of both infrastructure and human resources.[11] Though international frameworks lean towards a more integrated approach, particularly through the incorporation of principles of 'sustainable development', they also use measures that tend to focus mainly on one aspect of Biosecurity.[12] The international standard setting agencies governing areas of Biosecurity are also sectorial.[13]

In the current climate of increased globalisation the effectiveness of this approach is being re-considered. The FAO comments that "*the role of traditional*

---

[8] FAO, Rome 2003, ibid.
[9] FAO, Rome 2003, ibid.
[10] With the exception of Australia and New Zealand who now have integrated Biosecurity Departments and measures.
[11] FAO, Rome, 2003, op cit.
[12] For example the Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973 (CITES) and the Convention on Persistent Organic Pollutants 2001 (POPS Convention)
[13] The Codex Alimentarius Commission (Codex) has a mandate for food safety, the Office International des Epizooties (OIE) has a mandate for animal health and safety and the Commission on Phytosanitary Measures of the International Plant Protection Convention (IPPC) has a mandate for plant health and safety.

Biosecurity related institutions is expanding beyond agricultural production to public health and the environment"[14]. Even in light of its formally adopted definition of Biosecurity it seems that the FAO recognises that it would be counter-productive not to broaden the approach to Biosecurity. With greater levels of global trade and transport, the need to regulate effectively the areas of Biosecurity is ever increasing. Increased trade opportunities and the continual removal of trade barriers mean that states have an economic incentive to meet external requirements such as safety requirements for food production.[15] Clearly, there are significant economic gains to be made by meeting these demands, in the form of increased export opportunities. However, these increased demands also carry potential difficulties. Increased pressure on production can lead to pressures on the use of natural resources, directly affecting conservation measures. In a publication for the International Institute for Sustainable Development (IISD) and the Center [sic] for International Environmental Law (CIEL), Howard Mann and Stephen Porter, comment that "*expanding trade opportunities almost always requires an expansion of production from the exporting country...pressures to increase production can add to the environmental stresses. In some cases, there is a concern for longer term, irreversible damage due to such increased, trade-related production*"[16].

An increase in imports has the potential to affect the environment generally, as well as specific agricultural systems, through the increased risk of introducing invasive alien species including pests and diseases.[17] At a UNEP Conference of the Parties to the Convention on Biological Diversity, it was noted that "*the spread of invasive alien species is recognised a* [sic] *major threat to plant diversity, habitats and ecosystems, hence to food production and health. Invasive*

---

[14] FAO, Rome, 2003, op cit., para. 6.
[15] For example, EC Directives on Maximum Residue Limits for various food product types.
[16] Mann, Howard, and Porter, Stephen, *The State of Trade and Environmental Law 2003: Implications for Doha and Beyond.* Winnipeg: The International Institute for Sustainable Development (IISD) and Centre for International Environmental Law (CIEL), 2003. p7.
[17] It is necessary to note that while the CBD and international institutions such as UNEP refer to 'invasive alien species', in some cases the term 'non-native species' is preferred. This term has, for example, been adopted in the UK by DEFRA. The term non-native species is slightly wider than 'invasive alien species', recognising that detrimental environmental impacts may result from the

species cause enormous damage to biodiversity and agricultural systems"[18]. The issue of how to manage and regulate the risks posed by invasive alien species has become increasingly contentious, especially in light of the increased risks posed by global trade and transport systems. In fact, Mathew Stilwell, writing for CIEL, considers, "*Invasions by plants, animals and pathogens into non-native environments pose one of the most significant, but least addressed, threats to biodiversity*"[19]. The Secretariat of the Convention on Biological Diversity makes a similar case stating that "*the threat to biodiversity due to alien invasive species is considered second only to that of habitat loss*"[20]. The increase in global travel and tourism brings with it increased potential for the introduction of invasive species and if not sufficiently regulated can place natural resources under further pressure, for example, through the trade in rare or protected species.

The particular issue of GMOs should be considered at this point. As noted above, the regulation and management of GMOs is an area that cuts across different elements of Biosecurity and in fact the FAO notes the introduction and release of GMOs as a specific component of Biosecurity.[21] There are essentially two main issues to consider in terms of Biosecurity. The first is the transfer, trade and use of processed GM products. The second is the import into a state of live modified material or organisms. In both cases it has been argued that the use of GMOs could have severe impacts on biodiversity and conservation since, it is argued, such material could be invasive or could 'contaminate' plant species. Clearly these risks would be specifically relevant to plant health as well as to the environment. The arguments extend further to possible impacts on human and animal health and food safety.

---

introduction of an alien/non-native species that is not in fact invasive. An example would be an organism that attacks a natural enemy of a plant that consequently becomes invasive.

[18] Conference of the Parties to the Convention on Biological Diversity, Global Strategy for Plant Conservation, 'Technical review of the targets and analysis of opportunities for their implementation', Report of the meeting of technical experts on the Global Plant Conservation Strategy, Gran Canaria, 11–13 February 2002, UNEP/CBD/COP/6/INF/21, 5 March 2002.

[19] Stilwell, Mathew, *Should the WTO Negotiate New Trade Rules on Genetically Modified Organisms?*, Geneva: Center for International Environmental Law, Draft Discussion Paper, November 1999.

[20] Convention on Biological Diversity, *Alien Species; Introduction*, CBD News <www.biodiv.org/programmes/cross-cutting/alien/> (02/08/2006)

[21] FAO, Bangkok 2003, op cit.

It is essential that these Biosecurity issues be addressed in a coherent, effective manner. The current global climate presents opportunities for increased revenue through the securing of important export markets. However, this same climate also increases the potential to exploit resources in an unsustainable manner or to expose them to aliens which could have a severely detrimental effect on the economy through the effect on agriculture and related industries and the availability of other natural resources.[22]

In the current climate it is simply becoming less and less realistic to deal with these issues in isolation and an overarching approach should be acknowledged that recognises the relationship between the relevant areas. This has begun to happen at the international level.[23] The approach that is being adopted is that of Biosecurity. In light of this the FAO has made Biosecurity one of its sixteen Priority Areas for Inter-Disciplinary action. In a technical consultation in 2003, a representative of the Convention on Biological Diversity "*noted the value of a collaborative approach to Biosecurity*"[24]. These actions illustrate increasing acknowledgement of the relevance of the Biosecurity approach and the recognition it has gained at the international level.

---

[22] The CIEL notes that "*no inhabited region has escaped invasion*" (CIEL, *Turning off the Tap: Addressing International Invasive Alien Species Issues*, Center for International Environmental Law, Issue Brief for the World Summit on Sustainable Development, 26 August–4 September 2002. p.1). High profile incidents such as the UK outbreak of foot and mouth disease illustrate the devastation that can be caused by the introduction of invasive alien species.
[23] FAO, Bangkok 2003, op cit.
[24] FAO, Bangkok 2003 ibid.

1.2 THE INTERNATIONAL LEGAL FRAMEWORK

1.2.1 International Agreements affecting Biosecurity regulation

In section 1.1 the issues of what Biosecurity is and why it is so important that it is effectively regulated and managed were discussed. It can be seen that there is a pressing need for states to be able to regulate effectively the different aspects of Biosecurity in order to take advantage of trade opportunities and to protect their natural resources. States may therefore wish to implement particular frameworks, measures or rules in order to meet these objectives. However, it will be seen that individual states are not entirely free to determine what measures to apply since there are a number of international agreements which shape the way that national laws can be used to regulate Biosecurity.

These agreements fall broadly into two categories:

1. Agreements introduced by the World Trade Organisation (WTO Agreements), which pursue the WTO's objectives of liberalising trade.
2. Multilateral Environmental Agreements (MEAs), which have the goal of environmental conservation generally, or of specific goals relating to environmental protection, or the protection of plant, animal (and human) health.

The broad principles for the liberalisation of trade in goods, in areas including those of Biosecurity, and the specific conditions under the system are set out in the General Agreement on Tariffs and Trade (GATT) 1994.[25] Further to this Agreement are a number of more specific agreements dealing with specific trade issues. The most important WTO Agreements for the purposes of Biosecurity are the Agreement on the Application of Sanitary and Phytosanitary

[25] GATT 1994 sets out the main WTO rules concerned with the trade in goods as set out in the Marrakesh Agreement Establishing the World Trade Organisation. It is distinct from, but includes, the provisions of GATT 1947. For further explanation of the two GATT agreements see the WTO, 'GATT 1994: What is it?' at <http://www.wto.org/english/thewto_e/whatis_e/eol/e/wto02/wto2_4.htm> (02/08/2006)

Measures (SPS) and the Agreement on Technical Barriers to Trade (TBT).[26] These two agreements have important implications concerning the extent to which WTO Members can determine how to regulate and manage Biosecurity.

1.2.2 The Agreement on the Application of Sanitary and Phytosanitary Measures (SPS)

The SPS Agreement is the international agreement most directly relevant to Biosecurity and was introduced specifically to regulate the application of measures related to plant, animal and human health. The rules of the GATT 1994 permitted national measures "*necessary to protect human, animal or plant health or life*"[27] where such measures do not create unjustified trade barriers. However, it was recognised that the use of sanitary or phytosanitary (SPS) measures which were ostensibly for the purpose of protecting health and life but which were actually disguised protectionism could be a powerful barrier to free trade under the multilateral trading system.[28]

The use of SPS measures in this way would be inconsistent with the objectives of the multilateral trading system and the requirements of other WTO Agreements. The use of protectionist measures by way of SPS requirements could be seen as a 'back door' approach for countries to protect their own markets. Being consistent with the overall objectives of the WTO-GATT framework, the SPS Agreement aims, therefore, to establish a 'level playing field' for international trade with the aim of fair and equitable access to international markets for its Members. The World Trade Organisation explains, "*The basic aim of the SPS Agreement is to maintain the sovereign right of any government to provide the level of health protection it deems appropriate, but*

---

[26] Both established under the Agreement Establishing The World Trade Organization 1994, Annex 1A: Multilateral Agreements On Trade In Goods

[27] Article XX (b)

[28] WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, 1998. <http://www.wto.org/english/tratop_e/sps_e/spsund_e.htm> (02/08/2006).
See also Roberts, Donna, Orden, David, and Josling, Timothy, *WTO Disciplines on Sanitary and Phytosanitary Barriers to Agricultural Trade: Progress, Prospects and Implications for Developing Countries*. Paper prepared by The World Bank's Integrated Program of Research and Capacity Building to Enhance Participation in Developing Countries in the WTO 2000 Negotiations. Presented at the Conference on Agriculture and the New Trade Agenda in the WTO 2000 Negotiations. Geneva, Switzerland, 1999.

to ensure that these sovereign rights are not misused for protectionist purposes and do not result in unnecessary barriers to international trade"[29].

Annex A of the SPS Agreement includes a definition of SPS measures as follows:

"*1.* Sanitary or phytosanitary measure — *Any measure applied:*
(a) to protect animal or plant life or health within the territory of the Member from risks arising from the entry, establishment or spread of pests, diseases, disease-carrying organisms or disease-causing organisms;
(b) to protect human or animal life or health within the territory of the Member from risks arising from additives, contaminants, toxins or disease-causing organisms in foods, beverages or feedstuffs;
(c) to *protect human life or health within the territory of the Member from risks arising from diseases carried by animals, plants or products thereof, or from the entry, establishment or spread of pests*; or
(d) to prevent or limit other damage within the territory of the Member from the entry, establishment or spread of pests.

Sanitary or phytosanitary measures include all relevant laws, decrees, regulations, requirements and procedures including, inter alia, end product criteria; processes and production methods; testing, inspection, certification and approval procedures; quarantine treatments including relevant requirements associated with the transport of animals or plants, or with the materials necessary for their survival during transport; provisions on relevant statistical methods, sampling procedures and methods of risk assessment; and packaging and labelling requirements directly related to food safety".

According to this definition the scope of SPS measures is very wide, including organic and inorganic contaminants for the purposes of food safety and extending to all measures for the prevention of the introduction or spread of pests and diseases. This illustrates the far-reaching implications of the SPS Agreement on Biosecurity regulation, however, in order to understand the effect of the Agreement it is necessary to examine some of its substantive provisions.

Article 1.1 of the Agreement states,

> "*This agreement applies to all sanitary and phytosanitary measures which may, directly or indirectly, affect international trade. Such measures shall be developed and applied in accordance with the provisions of this Agreement.*"

[29] WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, op cit.

Article 2.1 states that

> *"Members have the right to take sanitary or phytosanitary measures necessary for the protection of human, animal or plant life or health, provided that such measures are not inconsistent with the provisions of this Agreement."*

The immediate implications for the regulation of Biosecurity are that any SPS measure taken, which might affect trade, must be consistent with the rules of the SPS Agreement, that is it must not be arbitrary or constitute disguised protectionism and should be applied consistently.[30] Whilst this presents immediate restrictions to the choices that can be made concerning how to regulate Biosecurity, it is consistent with the overall WTO-GATT principles. In light of the benefits perceived by WTO Members of a liberalised trading system, this does not pose any particularly controversial problems since the regulation of risks to life and health are only restricted where that regulation may constitute an unjustified barrier to trade. The general requirements for harmonisation and equivalence (under Articles 3 and 4 respectively) are deemed to increase further market access objectives through the equitable use and application of SPS measures.

There are some provisions in the SPS Agreement, however, which have proved more controversial.

Article 2.2 states that

> *"Members shall ensure that any sanitary or phytosanitary measure is applied only to the extent necessary to protect human, animal or plant life or health, is based on scientific principles and is not maintained without sufficient scientific evidence, except as provided for in paragraph 7 of Article 5".*

Article 5 goes on to establish rules for the "*assessment and determination of the appropriate level of sanitary or phytosanitary protection*" and provides that assessment must be appropriate to the circumstances (5.1) and shall take into

---

[30] Article 2.3 states, "*Members shall ensure that their sanitary and phytosanitary measures do not arbitrarily or unjustifiably discriminate between Members where identical or similar conditions prevail, including between their own territory and that of other Members. Sanitary*

account "*available scientific evidence; relevant process and production methods; prevalence of specific diseases or pests; existence of pest- or disease-free areas; relevant ecological and environmental conditions; and quarantine or other treatment*" (5.2) as well as economic factors including "*the potential damage in terms of loss of production or sales in the event of the entry, establishment or spread of a pest or disease; the cost of control or eradication in the territory of the importing Member; and the relative cost-effectiveness of alternative approaches to limiting risk*", (5.3).

Perhaps the most important provision is Article 5.7, which states:

> "*In cases where relevant scientific evidence is insufficient, a member may provisionally adopt sanitary or phytosanitary measures on the basis of available pertinent information, including that from the relevant international organizations as well as from sanitary and phytosanitary measures applied by other members. In such circumstances, members shall seek to obtain the additional information necessary for a more objective assessment of risk and review the sanitary or phytosanitary measure accordingly within a reasonable period of time*".

An essential principle of the SPS Agreement is that SPS measures that might affect international trade must be based on the principles of risk assessment with due account given to scientific evidence.[31]

In terms of Biosecurity regulation and the choices that can be made with respect to the regulation and management of identified risks it can be seen that the provisions of the SPS Agreement have far-reaching effects. The rules go further than simply requiring a non-discriminatory approach. To ensure that Members do not use SPS measures as a way to protect their own markets, the SPS Agreement provides for a situation where WTO Members are required to prove that their measures are not unjustified trade barriers by ensuring that, based on

---

and phytosanitary measures shall not be applied in a manner which would constitute a disguised restriction on international trade".

[31] The term 'risk analysis' refers to the overall regulatory process, comprising risk identification, risk assessment, risk management and (debatably) risk communication. 'Risk assessment' refers to the technical and scientific processes used to evaluate the probable impacts of the subject of the assessment. See, for example, ISPM No. 11: Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms (2004)

scientific evidence and risk assessment, the measures are necessary for the protection of human, animal or plant health or life. As the World Trade Organisation notes, "*A government can challenge another country's food safety or animal or plant health requirements on the grounds that they are not justified by scientific evidence*"[32]. The problem that is left for WTO Members is how, if at all, they are permitted to regulate risks which they consider to be important in terms of protection of human, animal or plant health or life, but for which the scientific evidence is not conclusive, for which current risk assessment techniques are inadequate or in situations in which a Member disputes the currently accepted approach to a particular risk. The question arising is, in such situations, to what extent are WTO Members able take a **precautionary approach** to the management of risk?

Article 5.7 makes provision for situations where scientific evidence is insufficient (see above) providing that SPS measures may be provisionally adopted on the basis of "*pertinent information*". Despite the examples given of where this information might come from, the Agreement does not entirely address what measures a WTO Member might apply in such situations of uncertainty as those described above. It does not address the extent to which Members may use a precautionary approach, only what other sources of information should normally be used in the absence of sufficient evidence. In its document 'Understanding the WTO Agreement on Sanitary and Phytosanitary Measures' the WTO states that "*the SPS Agreement clearly permits the precautionary taking of measures when a government considers that sufficient scientific evidence does not exist to permit a final decision on the safety of a product or process*" and that the SPS Agreement does not "*require countries to give priority to trade over food safety or animal and plant health*"[33]. However, in a more recent publication, the WTO applies a more qualified interpretation and considers that "*[Members] can* **to some extent** *apply the "precautionary principle", a kind of "safety first" approach to deal*

[32] WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, op cit.
[33] WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, ibid.

with scientific uncertainty"[34]. Even this qualified approach may be considered more inclusive of the **precautionary principle** than some decisions of the WTO Appellate Body in dispute cases, as will be seen.

1.2.3 The Agreement on Technical Barriers to Trade (TBT)

It is important to note that the provisions of the TBT Agreement do not apply to sanitary and phytosanitary measures as defined in Annex A of the SPS Agreement.[35] Whilst the SPS Agreement might be considered to be more relevant to the specific issues of Biosecurity, the provisions of the TBT Agreement also have an important impact on the regulation of that area since they apply to some other forms of health and environmental protection. As well as measures directly related to human, animal or plant health WTO Members may wish to impose certain standards on products or processes in order to meet domestic economic, environmental or health objectives. The Centre for International Development at Harvard University suggests three ways in which the use of standards can impact on trade:

> "*They can facilitate exchange by clearly defining product characteristics and improving compatibility and usability. They also advance domestic social goals like public health by establishing minimum standards or prescribing safety requirements. Finally, they can be used as hidden trade barriers, as protectionism in disguise*"[36].

The rationale behind the TBT Agreement is that whilst different WTO Members have the right to adopt measures which they consider necessary for any of the legitimate objectives set out in Article Two of the Agreement, including protection of human health or safety,[37] if such measures are applied in an arbitrary fashion they could constitute a measure of unjustifiable trade discrimination.[38] Like the SPS Agreement, the TBT Agreement seeks to prevent

---

[34] WTO, *Understanding the WTO*, 3rd Edition, Geneva: World Trade Organization, August 2003. (Updated October 2005). My emphasis.
[35] Agreement on Technical Barriers to Trade, Article 1.5.
[36] Centre for International Development at Harvard University, Sanitary and Phytosanitary Measures and Technical Barriers to Trade Summary, 2004 at Global Trade Negotiations Home Page <http://www.cid.harvard.edu/cidtrade/issues/spstbt.html> (02/08/2006)
[37] See Agreement on Technical Barriers to Trade, Article Two.
[38] See Agreement on Technical Barriers to Trade, Preamble.

the use of measures which could constitute protectionism.[39] The TBT Agreement is important for the purposes of Biosecurity because its rules affect the measures that are permitted at a national level for some areas of Biosecurity. Mathew Stilwell and Richard Tarasofsky, in a Worldwide Fund for Nature (WWF) publication, note that the TBT Agreement "*establishes disciplines on national standards and technical regulations taken by WTO members, including certain environmental regulations and labelling schemes*"[40].

To understand the effect of the TBT Agreement on Biosecurity it is again necessary to look at some of the provisions of the Agreement. The main principles of the Agreement are set out in Article 2: 'Preparation, Application and Adoption of Technical Regulations by Central Government Bodies'. Article 2.1 provides that imported products must be accorded treatment which is "*no less favourable than that accorded to like products of national origin and to like products originating in any other country*".

Article 2.2 states:

> "*Members shall ensure that technical regulations are not prepared, adopted or applied with a view to or with the effect of creating unnecessary obstacles to international trade. For this purpose, technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking into account the risks non-fulfilment would create. Such legitimate objectives are,* inter alia*: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. In assessing such risks, relevant elements of consideration are,* inter alia*: available scientific and technical information, related processing technology or intended end-uses of products*".

It can be seen that the TBT Agreement aims to ensure that all 'like' products are treated equally and that no 'technical regulation' should create an

---

[39] See WTO, 2003, op cit.

[40] Stilwell, Matthew and Tarasofsky, Richard. *Towards Coherent Environmental and Economic Governance: Legal and Practical Approaches to MEA-WTO Linkages.* A WWF-CIEL Discussion Paper. Gland, Switzerland: Worldwide Fund for Nature. 2001. p.9.

unnecessary trade barrier. Where pursuing a 'legitimate objective' measures must create the minimum restrictions to trade possible.[41]

Of particular relevance in the present case is the extent to which the TBT Agreement allows countries to treat products differently in pursuing national health and environmental objectives. The TBT Agreement applies to process and production methods related to the characteristics of a product.[42] This area of the TBT Agreement has caused much discussion but there is still little clarity as to how the provisions apply to certain measures.[43] The Centre for International Development at Harvard University comments that "*nations disagree, for example, over the extent to which the TBT Agreement allows nations to differentiate between identical products that were produced in different ways. Can a country treat products differently because the production methods used have different environmental impacts?*"[44] In a situation similar to that outlined above a national labelling requirement, for example, might be open to challenge and also to the accusation that it discriminates against 'like' products.

The points raised above illustrate the effect of the TBT Agreement on the regulation and management of Biosecurity. Whilst the provisions of the Agreement might be immediately beneficial to states in economic terms, by providing improved access to international trade, they may restrict the other objectives of Biosecurity— the protection of human, animal and plant health and the environment. As discussed above, the scope of these issues has not been resolved but where the answer to this question is essentially 'no' then WTO Members may find that some choices concerning Biosecurity measures are restricted.

---

[41] See Agreement on Technical Barriers to Trade, Annex 1 for terms and definitions.
[42] See Agreement on Technical Barriers to Trade, Annex 1. Process and production methods fall within the definition of 'Technical Regulation'.
[43] Center for International Development at Harvard University, op cit.
[44] Center for International Development at Harvard University, ibid.

In the basic analysis of the SPS and TBT Agreements above, it can be seen that WTO Members are not entirely free to regulate the different areas of Biosecurity. Of course, the purpose of these WTO requirements is to ensure that WTO Members are able to benefit from a fair and open international trading system and that all Members are able to compete on an equitable basis. However, in pursuing these objectives WTO Members must be aware of the potential restrictions that are imposed on the regulation and management of environmental protection and the protection of human, animal and plant health and life.

The TBT and the SPS Agreements are perhaps the most important WTO Agreements impacting on Biosecurity choices, but it is not only WTO Agreements that affect the regulation of Biosecurity. Multilateral Environmental Agreements (MEAs) also provide certain obligations on Contracting Parties which may affect the Biosecurity measures that a Party could adopt. A wide range of MEAs exist and a large number of these have some degree of relevance to Biosecurity. For the present purposes, however, two of the most significant agreements are the Convention on Biological Diversity (CBD) and the Convention on the International Trade in Endangered Species of Wild Fauna and Flora (CITES). The implications of these agreements, with respect to Biosecurity, should briefly be considered since their interaction with WTO Agreements in particular may present challenges.

1.2.4 The Convention on Biological Diversity

Perhaps the most relevant MEA related to Biosecurity is the Convention on Biological Diversity (the CBD). The CBD was adopted at the Rio Earth Summit[45] and is considered to be the "*first global agreement on the conservation and sustainable use of biological diversity*"[46]. Whilst the WTO Agreements seen above have the success of the multilateral trading system as

---

[45] United Nations Conference on Environment and Development (UNCED), Rio de Janeiro, 3–14 June 1992

[46] FAO, *Biological Diversity in Food and Agriculture: Convention on Biological Diversity*. <http://www.fao.org/biodiversity/CBD_en.asp> (02/08/2006)

their central objective the CBD focuses on the preservation and sustainable use of environmental resources.

The CBD has three main goals:

- The conservation of biodiversity
- Sustainable use of the components of biodiversity and
- Sharing the benefits arising from the commercial and other utilisation of genetic resources in a fair and equitable way.[47]

It can be seen that the goals of the CBD are directly relevant to the principles of Biosecurity, particularly the general principles of plant health and environmental protection. Obligations imposed by the CBD will therefore have some impact on the way in which the CBD's Contracting Parties can regulate and manage Biosecurity frameworks at the national level. Analysis of some of the provisions of the CBD shows how it is relevant to the field of Biosecurity and how it can affect the way Biosecurity is regulated and managed.

Article 4 of the Convention states:

> "*Subject to the rights of other States, and except as otherwise expressly provided in this Convention, the provisions of this Convention apply, in relation to each Contracting Party:*
> *(a) In the case of components of biological diversity, in areas within the limits of its national jurisdiction; and*
> *(b) In the case of processes and activities, regardless of where their effects occur, carried out under its jurisdiction or control, within the area of its national jurisdiction or beyond the limits of national jurisdiction*".

Article 4 illustrates that the Convention is concerned not only with general conservation measures for the purposes of biological diversity but also applies to the regulation of specific components of biodiversity and to the way in which Contracting Parties can carry out certain activities, including those that potentially have an affect outside their national jurisdiction, which may impact

---

[47] See Convention on Biological Diversity, *Sustaining Life on Earth: How the Convention on Biological Diversity promotes nature and human well-being.*

on biological diversity. This means that in implementing the CBD Contracting Parties must consider the wider context in which their policies may affect biodiversity. This may have important consequences in terms of Biosecurity regulation by shaping the way in which frameworks can be adopted for the management of risk where those frameworks might impact on the mandated areas of the CBD.

Article 6 requires Contracting Parties to develop national strategies and programmes for the conservation and sustainable use of biological diversity and to integrate, "*as far as possible and appropriate*" the conservation and sustainable use of biological diversity into relevant cross-sectoral plans and programmes. Article 8 provides a number of obligations for Contracting Parties with respect to *in-situ* conservation including

- the establishment or maintenance of means to regulate and manage the risks associated with LMOs and biotechnology "*which are likely to have adverse environmental impacts that could affect the conservation and sustainable use of biological diversity, taking also into account the risks to human health*" (paragraph g);
- preventing the introduction of, controlling or eradicating, alien species "*which threaten ecosystems habitats or species*" (paragraph h); and
- develop and/or maintain legislation and regulatory provisions for the protection of threatened species and populations (paragraph k).

A number of other obligations exist in the Convention: Article 7 provides obligations concerning identification and monitoring; Article 9 provides obligations for *ex-situ* conservation and Article 10 for the sustainable use of components of biological diversity.

Whereas the WTO Agreements discussed above were concerned primarily with the restriction of measures relating to Biosecurity, that is, they prevented measures which might form an unjustified barrier to trade, it can be seen that the approach of the CBD is the opposite. The primary function of the CBD in

---

<http://www.biodiv.org/doc/publications/guide.asp> (02/08/2006). These goals can be found in Article 1 of the Convention.

achieving its goals is to impose on the Contracting Parties positive measures for the conservation of biological diversity and its components. The system is intended to benefit Contracting Parties by providing national sovereignty over national resources. It can be seen from the obligations of Article 8 that these measures will necessarily impact on the choices that national governments can make concerning the regulation and management of Biosecurity in terms of both sanitary and phytosanitary risk and the protection of the environment.

Clearly, in pursuing these obligations Contracting Parties must take into account the way in which risks to human, plant and animal health are regulated with regard to meeting the three objectives of the CBD. All of these areas fall within the scope of Biosecurity and therefore national governments must be mindful of these obligations when developing and implementing Biosecurity regulation and management frameworks.[48]

1.2.5 The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

CITES is illustrative of the broad affects and influence that environmental agreements can have with respect to national Biosecurity frameworks. The trade in species of plants and animals can provide various important sources of revenue, for example, the trade in particular goods in tourism and for traditional medicines. However, if this trade becomes unsustainable the risks to plant and animal life and health (and subsequently human life and health) and on the environment generally are acute and loss or severe decline of a species will have an impact on Biosecurity and the economy.

This issue has been of international concern for a number of years and, in fact, was discussed at the International Union for Conservation of Nature and Natural Resources (IUCN) Seventh General Assembly in 1960 which "*urged governments to restrict the import of animals in accordance with the export*

---

[48] A related issue is that of 'perverse incentives' which have been defined by CBD as "*a policy or practice that encourages, either directly or indirectly, resource uses leading to the degradation of biological diversity*". See Convention on Biological Diversity, *Economics, Trade and Incentives: Information on Perverse Incentives.* <http://www.biodiv.org/programmes/socio-eco/incentives/perverse.asp> (02/08/2006)

regulations of origin"[49]. In 1963 the IUCN passed a resolution calling for "*an international convention or regulations of export, transit and import of rare or threatened wildlife species or their skins and trophies*"[50]. The eventual outcome of this international concern was the adoption in 1973 of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).[51] CITES introduced an international framework for the regulation of trade in species, and in fact is not restricted to endangered species.[52]

Article II provides three appendices covering different levels of regulated species:
Appendix I applies to species threatened with extinction which are or may be affected by trade;
Appendix II applies to species which may become threatened with extinction unless the trade in those species is subject to strict regulation;
Appendix III applies to all species which Parties identify as being subject to regulation within its jurisdiction "*for the purpose of preventing or restricting exploitation and as needing the co-operation of other Parties in the control of trade*"[53].

Article II, Paragraph 4 states "*the Parties shall not allow trade in specimens of species included in Appendices I, II and III except in accordance with the provisions of the present Convention*". Subsequent Articles of the Convention place further obligations on Contracting Parties by introducing an import and export permit system for the movement and trade in specimens listed in the appendices. Articles III, IV and V apply to Appendix I, II and III respectively and set out conditions for the granting of permits. For example, Article III (2)

---

[49] See Wijnstekers, Willem, *The Evolution of CITES*, 6th edition, Geneva, Switzerland: CITES Secretariat, 2001. p.5.
[50] Wijnstekers, ibid. p.5.
[51] CITES entered into force in 1975.
[52] According to Article II (3), Appendix III "*shall include all species which any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation...*"
[53] Article II. Appendix 2 also includes "*other species which must be subject to regulation in order that trade in specimens of certain species referred to in sub-paragraph (a) [those that*

requires that any species listed in Appendix I shall only be exported if accompanied by an export permit.[54] That permit shall only be granted where:

> "*(a) a Scientific Authority of the State of export has advised that such export will not be detrimental to the survival of that species;*
> *(b) a Management Authority of the State of export is satisfied that the specimen was not obtained in contravention of the laws of that State for the protection of fauna and flora;*
> *(c) a Management Authority of the State of export is satisfied that any living specimen will be so prepared and shipped as to minimize the risk of injury, damage to health or cruel treatment; and*
> *(d) a Management Authority of the State of export is satisfied that an import permit has been granted for the specimen*".

CITES affects the trade in species including determining which specimens can be exported, under what conditions and also which specimens can enter a country, since any species coming into a country should be authorised by the exporting country. The affect of CITES on Biosecurity regulation is that it imposes another set of obligations (concerning protection of plant and animal life) on its Contracting Parties. This means that, as with other international agreements, the choices that Contracting Parties can make with respect to how to regulate and manage the field of Biosecurity at the national level are subject to certain restrictions.

The purpose of CITES is to protect plant and animal species and this will be relevant to the choices that can be made in relation to the management of risks to those species. Clearly CITES will have a particular impact on the area of trade and Contracting Parties may be forced to alter frameworks concerned with trade in species in order to comply with their obligations under CITES. For example, a Contracting Party may have a large trade in products of a particular species for the tourist industry, which has an important role in the national economy. If that particular species is listed under one of the Appendices to CITES, then the Contracting Party will be under an obligation to restrict the

---

may become threatened with extinction] of this paragraph may be brought under effective control".
[54] Article II (1).

trade in that species in order to comply. The use and trade of the species may not have been previously regulated, particularly in the light of its economic contribution, but the Contracting Party will be obliged under CITES to implement a framework which will have an effect on the management of risks to plant or animal health. In this way CITES potentially impacts upon the approach which its Contracting Parties will take towards Biosecurity regulation and management and the choices that the national government can make.

1.3 BIOSECURITY ISSUES IN THE FIELD OF TRADE AND ENVIRONMENT

A number of issues have arisen concerning the implications of the WTO Agreements, including the SPS and TBT Agreements, for the sovereignty of states in determining appropriate standards and adopting measures for human, animal and plant health and for broader environmental protection purposes. Some of these are directly relevant to Biosecurity, others are indirectly relevant. However, it should be understood that Biosecurity is a relatively new area of concern (having become of much greater interest in light of increased globalisation and the WTO Agreement 1994 as compared with the much longer standing issues related to conservation and the preservation of species). Therefore, these debates have often taken place within what might be termed the 'trade versus environment field'.[55] This is particularly so in the context of the tensions between international trade agreements (the WTO Agreements) and MEAs. Since, as indicated, these are relevant, to a greater or lesser extent, to Biosecurity, and since such a large body of literature has focused on these issues (from a trade versus environment perspective), it is important to review briefly some of the main arguments and debates in this field and their more specific implications with respect to Biosecurity. The trade and environment issues discussed below are therefore considered in the context of the need to control risks associated with human, animal and plant health and life.

1.3.1 The trade and environment debate: introduction

The WTO Agreements under discussion affect the environmental measures that can be taken by WTO Members by requiring a non-trade restrictive approach. The MEAs affect trade because they impose positive obligations on Contracting Parties not to carry out certain activities that will adversely affect the environment or to take measures to conserve or restore it. In terms of managing Biosecurity these possible conflicts are problematical because they may make it difficult or unclear as to how states can meet their international obligations and

[55] Perhaps because the field of international environmental law, and the related trade debates, are relatively well established, certain issues which might now be thought to be as relevant to Biosecurity as to general environmental protection have nevertheless been included in these

effectively regulate and manage Biosecurity effectively. If states are to manage Biosecurity successfully at the national level they must be clear as to whether their proposed measures will have adverse effects in terms of insufficient regulation of risks to human, animal and plant health and environmental protection or of breaching their international trade obligations. As discussed, either of these results could have significant negative effects on a state, economically and in terms of insufficient use and management of natural resources. It is desirable for states to be able to regulate risks to human, animal and plant health and the environment at a level which they deem appropriate whilst taking advantage of international markets through the elimination of unnecessary trade barriers and protectionism.

Despite common goals of sustainable development the debate on issues surrounding the international treatment of trade and environment measures has often been split between champions of free trade and environmentalists. This means that establishing harmonious relationships between these two pillars of international law has been difficult and has led to a common perception of 'free trade versus environment'.

There is wide recognition that the trade-environment debate has become one of the most prominent issues in the international arena today. Mann and Porter note that "*over the last decade [the debate] has become an important focus for environmental and other civil society groups*"[56]. This sentiment is echoed by the WTO.[57] The sustainable development summit was an important factor in bringing these issues into the public domain.[58] Another factor often cited as contributing to the proliferation of the trade-environment debate is the dispute resolution process under the GATT and, since 1994, the WTO and some of the subsequent high profile cases. Commenting on the state of the law as in 1994 Mann and Porter note that "*the role of MEAs in the trade law system is*

'trade-environment' debates including, for example, the human health issues arising from the beef-hormones and EC-asbestos cases.

[56] Mann and Porter, op cit. p.v.

[57] WTO, 2003, op cit.

[58] World Summit on Sustainable Development (WSSD), Johannesburg, South Africa. 26 August–4 September 2002.

perceptually dominated by the Tuna-Dolphin cases"[59] and the WTO Special Study on Trade and Environment acknowledges that the current debate was "*prompted by the controversial 1991 tuna-dolphin dispute*"[60]. The importance of these (pre-WTO) cases should not be under-estimated. The *tuna-dolphin* cases have become synonymous with the balancing of trade and environment considerations and the issues raised in those cases sparked a considerable amount of debate. However, the importance of the 1994 Marrakesh Agreement Establishing the WTO should not be overlooked. Under the 1947 GATT Agreement substantial progress had been made in liberalising the international trading system. However, the 1994 Agreement, which also provided for the current dispute resolution process, specifically included the objective of sustainable development in the preamble. This paved the way for some controversial developments in the trade-environment debate based on restrictions on the freedom of national governments to implement environmental protection measures where those measures may interfere with trade.

One of the main problems with reconciling trade-environment debates is that advocates of either pillar often contend that the other has adverse effects in terms of sustainable development. Though there has occasionally been support for the theory that the multilateral trading system can provide a 'win-win-win' situation in terms of trade, environment and development objectives[61], the more common argument has been that the approaches to international trade and international environmental regulation are incompatible in some important areas. Scott Vaughan and Greg Block comment succinctly on this matter; "*Over the past decade, the trade environment debate has involved claims that increased trade undermines environmental quality through scale-effects and counter-claims that free trade enables countries to grow out of their*

---

[59] Mann and Porter, op cit., p.20. See p.24 for discussion of these cases.
[60] Nordström, Håkan and Vaughan, Scott, *WTO Special Studies 4: Trade and Environment*, Switzerland: WTO 1999. p.29.
[61] See, for example, CTE Trade and Environment News Bulletin TE/028 31 March 1999, Item 6.

environmental problems"[62]. Vaughan and Block examine some of the issues surrounding the relationship between trade and the environment and note that "*a common rallying point is that the means by which trade has traditionally been formulated is opaque, non-participatory and somehow undemocratic*"[63]. This is not an isolated view.[64] Similarly, trade advocates contend that environmental policies have been used as disguised protectionism, that environmental measures can restrict the development benefits of the trading system and that the trading system does not adversely affect the environment.

In light of this overall climate of tension between trade and environment objectives some issues have been consistently identified and are considered to be the most pressing in the trade-environment debate. The present review of some key papers has identified these common issues as:

- The compatibility of trade measures in Multilateral Environmental Agreements (MEAs)
- The issue of process and production methods (PPMs) and of Eco-labelling
- The use of the Precautionary Principle and risk based assessment[65] [66].

These issues will be considered now in terms of the potential effects of arguments on the regulation of Biosecurity.

---

[62] Vaughan, Scott and Block, Greg, *Free Trade and the Environment: The Picture Becomes Clearer*, Quebec: Secretariat of the Commission for Environmental Cooperation of North America, 2002. p.1.

[63] Vaughn and Block, ibid., p.1.

[64] See also Reid, Dylan. *Free Trade, not Forced Trade: How to Settle Seattle,* Canadian Commentary, February 2000, <http://www3.sympatico.ca/dylan.reid/seattle.htm> (02/08/2006)

[65] These issues are all recognised and considered in the following publications: United Nations Environment Programme (UNEP) and the International Institute for Sustainable Development (IISD), *Trade and Environment: A Handbook,* Winnipeg: IISD, 2000; WTO, 2003, op cit.; Mann and Porter, 2003, op cit.; Stilwell and Tarasofsky, 2001 op cit.; The significance given to each issue varies between publications.

[66] An important fifth issue is consistently recognised when examining the relationship between trade and the environment and that is the issue of intellectual property rights, particularly issues arising from the implementation of the CBD and the Agreement on Trade Related Aspects of Intellectual Property (TRIPS). That issue will not be considered here because it is beyond the scope of an analysis of issues affecting Biosecurity regulation. However it is an important aspect of the trade environment debate. Some consideration of the issues arising and current position can be found in the following publications: Eugui, David Vivas, *Issues linked to the Convention on Biological Diversity in the WTO: Implementing Doha Mandates*, Geneva: CIEL. 2002; WTO, 2003, op cit.; UNEP and the IISD, 2000, op cit.

1.3.2 Trade related measures in MEAs

There are currently about two hundred MEAs of which approximately twenty contain provisions that can affect trade.[67] Trade related measures in MEAs (such as those identified in the CBD and CITES above) have become an important part of the international trade-environment debate because of the controversy over how these measures are to be dealt with in the event of a dispute concerning differences between the MEA measure and WTO provisions.

There are a number of reasons for the inclusion of these measures in MEAs. Mann and Porter summarise these succinctly:

- "*discouraging unsustainable exploitation of natural resources;*
- *discouraging environmentally harmful production processes;*
- *creating market opportunities and incentives to use or dispose of a good in an environmentally sound manner;*
- *preventing or limiting the entry of a harmful substance into a country;*
- *inducing producers to internalize the costs to the environment caused by their products or production processes;*
- *preventing non-Parties from exploiting lower environmental standards to gain unfair competitive advantages;*
- *discouraging the migration of industries to countries with lower environmental standards;*
- *reducing the incentives for countries to remain outside the agreement and become "free riders" who can benefit competitively from the absence of MEA standards;*
- *controlling trade, where trade provides market incentives that threaten the environment; and*
- *enhancing compliance with MEA rules*"[68].

Stilwell and Tarasofsky note that "*trade measures are an essential policy instrument in the toolbox of measures available to environmental negotiators*"[69]. Clearly then the purpose of trade-related measures in MEAs is generally accepted and the WTO does not dispute the legitimate purpose of

---

[67] WTO, 2003, op cit. See also CTE Trade and Environment Bulletin TE/033 10 July 2000 items 1 & 5, which puts the estimate at 10% of about 200, and Schwartz, Risa 'Trade Measures Pursuant to Multilateral Environmental Agreements – Developments from Singapore to Seattle', *Review of European Community and International Environment Law (RECIEL)*, vol. 9, no. 1, April 2000, pp. 63–70, which suggests the same figure.

[68] Mann and Porter, op cit., pp.19–20

[69] Stilwell and Tarasofsky, op cit., p.7

such measures noting that "*actions taken to protect the environment and having an impact on trade can play an important role in some environmental agreements*"[70].

The restrictions in specific WTO Agreements have been discussed and it has been seen that these Agreements require a non-discriminatory, non-trade restrictive approach to regulation. In turn, these Agreements derive their rationale from the general principles enshrined in the GATT 1994. The Articles to GATT set out the general principles for the multilateral trading system. Article I provides that no country should receive treatment which would distort the multilateral trading system. Article III provides that products of other Members must be treated in the same manner as domestically produced goods. Article XI prohibits the use of quotas, import or export licences or similar measures (agricultural products are exempt from this). Article XX provides exceptions to the usual rule that where a national law is inconsistent with trade rules the WTO Member must modify it. The Article XX (b) and (g) exceptions apply where the measure is necessary to protect human, plant or animal life or health or for the conservation of exhaustible natural resources[71] provided these do not constitute arbitrary or unjustifiable discrimination.

It will be seen that there are immediate problems regarding the two MEAs discussed above in relation to Biosecurity. The CBD imposes positive obligations on its Contracting Parties, which may conflict with the GATT principles. For example it requires parties to regulate and manage conservation of biological diversity both *in-situ* and *ex-situ* and to control and prevent a number of risks. In pursuing these objectives a Contracting Party may find it necessary to impose some measures which affect trade. CITES expressly requires the use of import and export permits in certain circumstances and provides for a number of requirements to be met before such a permit can be issued. Clearly these could conflict with the principles enshrined in the GATT-WTO system. The issue, therefore, is how can this conflict be reconciled? In the

---

[70] WTO, 2003, op cit.
[71] Articles XX (b) and XX (g) respectively

event of a dispute how will such a conflict be resolved and what will determine the outcome? This argument is not merely academic. It has very important implications in terms of how Biosecurity risks can be managed because it will affect the extent to which states can regulate risks to life and health as well as the preservation of the environment.

Some WTO Members have expressed a concern that since no such dispute has yet occurred the issue should not be exaggerated.[72] However, the need to reconcile these differences before such a dispute does occur is recognised in the mandate of the WTO Committee on Trade and Environment (CTE), which provides for examination of "*the relationship between the provisions of the multilateral trading system and trade measures for environmental purposes, including those pursuant to multilateral environmental agreements*"[73]. To date, the CTE is considered to have made little progress in this respect.[74] There remains, therefore, a clear demand for clarification.[75] Stilwell and Tarasofsky note that "*until greater legal certainty is achieved the use of trade and trade-related measures in MEAs will likely remain undeveloped and MEAs that include trade measures will be inadequately implemented*"[76]. The arguments suggest that there can be no consistent application of international environmental measures (and by extension related Biosecurity measures) where there is uncertainty about their legitimacy and the way in which they should be applied within the context of WTO obligations.

Mann and Porter argue that some reconciliation of the issue can be seen in the post 1995 treatment of trade-environment disputes. They suggest that, though it

---

[72] CTE Trade and Environment Bulletin TE/033, op cit.

[73] The CTE was established following the adoption of the Marrakesh Agreement 1994, under the Decision on Trade and Environment. The CTE work programme is summarised at <http://www.wto.org/english/tratop_e/envir_e/cte00_e.htm> (03/08/2006). See also the Ministerial Decision on Trade and Environment, available at <http://www.wto.org/english/docs_e/legal_e/legal_e.htm> (03/08/2006).

[74] Stilwell and Tarasofsky, 2001, op cit. See also Schwartz, 2000, op cit.

[75] At a meeting of the CTE "*Switzerland called for an interpretative decision to prevent unnecessary conflicts between the WTO and trade-related measures in MEAs, thereby creating more predictability and legal certainty*". Several other members supported this call though "*several members, including Australia, New Zealand and the US, felt that the WTO already provides a sufficient framework to facilitate mutual supportiveness*". CTE Trade and Environment Bulletin TE/033, op cit.

was not a situation of a specific treaty provision being read into the WTO agreements, the consideration of the position of the precautionary principle in the *beef -hormones* case[77] "*indicate [s] a more expansive opening for seeing international environmental law more generally as a source of input into the interpretation of WTO provisions*". Further they argue that in the *shrimp-turtle* case[78], "*the Appellate Body significantly expanded the scope for considering MEAs*"[79]. There are some problems with applying this argument to the issue of trade-related measures in MEAs. The beef-hormones case considered the status of the precautionary principle in international law but the precautionary principle is just that— a principle. Whether or not it is an established principle of [customary] international law is another debate but it is not comparable to trade related measures in MEAs because it does not provide explicit, positive obligations such as those found in the CBD and CITES. Similarly, the issue in shrimp-turtle was the right of one WTO Member to impose certain environmental standards outside its jurisdiction ('extra-territorial measures'). The WTO has repeatedly stated that the important feature of the GATT-WTO system is that it is rules-based and not power-based and therefore any unilateral action taken by a WTO Member will be incompatible since it allows Members to impose their own standards on other states and this can be an unfair barrier to trade.[80] Cases such as shrimp-turtle consider the **right** of WTO Members to enact environmental measures that affect trade but in MEAs that right has been enshrined in an international agreement and recognised by Contracting Parties. Relying on the WTO Dispute Settlement Understanding (DSU) is not sufficient when considering the compatibility of MEA measures because it assumes a certain hierarchy of international obligations, with GATT at the top and MEAs falling beneath it. However, there is no overarching rule that states that this should be the case.[81]

---

[76] Stilwell and Tarasofsky, 2001, op cit., p.10.
[77] *EC – Measures Concerning Meat and Meat Products (Hormones)*, Report of the Appellate Body, WT/DS26/AB/R, WT/DS48/AB/R, January 16, 1998.
[78] *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, Report of the Appellate Body, WT/DS58/AB/R, October 12, 1998.
[79] Mann and Porter, 2003, op cit., p.22.
[80] WTO, 2003, op cit; Renato Ruggiero, 'Trade and the Environment', in *Trade, Development and the Environment*, WTO Secretariat, eds., London: Kluwer Law International, 2000.
[81] The interpretation of international agreements is governed by the Vienna Convention on the Law of Treaties 1969. Article 30 is concerned with the 'Application of successive treaties

The scope of this section does not stretch to a discussion of politics in terms of which organisation(s) should have the primary responsibility for considering trade-environment disputes and whether trade and trade-related measures in MEAs should be within the mandate of the WTO DSU. However, it is clear that there is a need for policy clarification in this area. At the moment, states cannot be clear about what they must consider when implementing Biosecurity frameworks or whether such frameworks will result in a breach of their international trade or environment obligations. This means that it may be very difficult for states effectively to regulate Biosecurity and the concept of regulatory 'chill' may result in a lack of sufficient regulation of risks to human, animal and plant health and life and the environment. States must therefore be mindful of these issues when implementing Biosecurity frameworks.

1.3.3 Process and Production Methods and Eco-labelling

In order to protect the environment or to manage risks to plant or animal health, states may wish to distinguish products based on the process and production methods (PPMs) to which they have been subject. For example, a state may wish to distinguish between products that have been produced in a sustainable manner and those that have not.

The term 'process and production method' refers to the way in which a product was made: "*The various processes will have different sorts of environmental impacts*"[82]. Measures that do not find a reflection in the final product (so that the final product does not have qualities which would cause it to be treated

---

relating to the same subject-matter'. Paragraph 2 states "*When a treaty specifies that it is subject to, or that it is not to be considered as incompatible with, an earlier or later treaty, the provisions of that other treaty prevail.*" However, Article 30 applies only in situations where "*the rights and obligations of States parties to successive treaties relating to the same subject-matter*". The nature and content of the competing international trade and international environment agreements make it unlikely that this would be the case. Winter attempts to identify a consistent approach and considers general legal principles. The following example illustrates the difficulty of applying this to CITES and GATT, "*The general principle of* lex specialis *could be considered... but which is more specialised; CITES because it only applies to special 'goods' or the GATT because it only protects special basic freedoms*" (Winter, Gerd, 'The GATT and Environmental Protection: Problems of Construction', *Journal of Environmental Law*, vol. 15, no. 2, 2003, pp. 113–140. p.137).

[82] UNEP and IISD, 2000, op cit., p.41–42.

differently in its use, handling or disposal[83]) are known as non-product PPMs and have been the main focus of the PPM debate.[84 85]

The principles of the GATT require that any advantage granted by a WTO Member to any product originating in, or destined for, any other country shall also be accorded to the like product originating in, or destined for, all other WTO Members (Most Favoured Nation Treatment, Article 1). Article III (National Treatment) also requires that any internal requirements affecting the internal sale, offering for sale, purchase, transportation, distribution or use of products should not be applied so as to afford protection to domestic products (Article III (1)) and that products of any WTO Member shall be accorded treatment no less favourable than that accorded to like products of national origin (Article III (4)). Difficulties with the application of measures distinguishing PPMs arise, therefore, because of the obligations of WTO Members to act on the basis of these principles of non-discrimination and because such measures can be arbitrary and protectionist.[86] It is also argued that such measures can constitute eco-imperialism, since the standards appropriate for one country may not be appropriate for another, and that it is unfair for developed countries to discriminate against developing countries' exports forcing them to adopt western environmental priorities in place of other development opportunities.[87]

The first issue of concern with respect to the GATT obligations is the extent to which a state can adopt measures which address the PPMs of imported products. One of the principle arguments here is that if states are not able to impose particular standards for imported products then it is unlikely that they will be able to implement them domestically due to the need to compete with imported products and this could lead to a 'race to the bottom' for

---

[83] UNEP and IISD, 2000, ibid., p.42, Mann and Porter, op cit., p.7.
[84] The other type of PPM is one which does find a reflection in the final product and is known as 'product' related'.
[85] Mann and Porter, 2003, op cit., p7. UNEP and IISD, 2000, op cit.
[86] See Brittan, Sir Leon, 'Trade and the Environment', in *Trade, Development and the Environment,* WTO Secretariat, eds., London: Kluwer Law International. 2000.

environmental measures.[88] Clearly, however, allowing such measures provides an opportunity for protectionism.

The second issue concerns discrimination between 'like products'. Such discrimination is generally prohibited under the GATT on the basis that it is goods, not PPMs, that are traded and that the focus on the end-product prevents the adoption of protectionist measures.[89] States may, however, wish to distinguish products as 'unlike' based on their environmental impacts.[90] It is sometimes argued, therefore, that WTO Members should be able to recognise different PPMs as 'unlike' where necessary and therefore not subject to the GATT rules of non discrimination between 'like' products[91] [92].

Several cases have been considered which addressed some of the issues relating to the use of measures concerning PPMs. Perhaps the most notorious of these have been the *tuna-dolphin* cases.[93] These cases concerned a US measure banning the import of tuna from countries that did not employ measures to reduce the occurrence of dolphin as a by-catch from tuna fishing. The ban also covered processed tuna products from countries that did not have 'dolphin friendly' requirements in line with those of the USA. The ban was challenged by Mexico and then by the EC. The GATT Dispute Panel (the Panel) agreed with Mexico that measures regulating PPMs that were not directly reflected in

---

[87] UNEP and IISD, 2000, op cit.; Mann and Porter, 2003, op cit.; Cosbey, Aaron, 'The WTO and PPMs: Time to Drop a Taboo,' *Bridges Between Trade and Sustainable Development*, ICTSD, 5, no. 1–3, January–April 2001, pp.11–12.

[88] Mann and Porter, 2003, op cit.; Gaines, Sanford. E., 'International Trade, Environmental Protection and Development as a Sustainable Development Triangle', *Review of European Community and International Environmental Law (RECIEL)*, vol. 11, no. 3, November 2002, pp. 259–274.

[89] Isaac Grant. E. and Kerr Willam. A., 'Genetically Modified Organisms and Trade Rules: Identifying Important Challenges for the WTO', *The World Economy*, vol. 26, no. 1, January 2003, pp. 29–42.

[90] Stilwell and Tarasofsky, 2001, op cit.

[91] Winter, 2003, op cit.; Damian Michel, Graz Jean-Christophe, 'The World Trade Organisation, the Environment and the Ecological Critique', *International Social Science Journal*, vol. 53, no. 170, December 2001, pp. 597–610; Mann and Porter, 2003, op cit.

[92] In fact it has been argued that the distinction between product standards and PPMs "*is neither based in GATT text and negotiating history, nor useful in application*", (Cosbey, 2001, op cit., p.11), though this is not the prevalent view.

[93] *United States – Restrictions on Imports of Tuna*, Report of the Panel, (DS21/R-39S/155), 1991, (not adopted) (tuna-dolphin I). *United States – Restrictions on Imports of Tuna*, Report of the Panel, (DS29/R), 1994, (not adopted), (tuna-dolphin II).

the final product were inconsistent with Article III.[94] The Panel stated that "*Article III (4) therefore obliges the United States to accord treatment to Mexican tuna no less favourable than that accorded to the United States*"[95]. In the second case the Panel stated that since the USA's measure could only be successful if it compelled other states to change their national laws and policies to be in line with those of the USA, it could not be for the purposes of conservation.[96] It is is therefore recognised that these decisions rejected the legitimacy of measures relating to PPM, particularly concerning the issue of extraterritoriality.[97]

Following this was the *shrimp-turtle* case.[98] In this case the United States of America imposed regulations ostensibly for the purpose of sea turtle conservation. The regulations exluded the importation of shrimp products from countries except those certified under the regulations. Central to this certification was the requirement to use turtle excluder devices (TEDs) or measures comparably effective. Concerning extra-territoriality, the Appellate Body (AB) considered that conditioning access to Members domestic markets based on whether they comply with a policy "*may, to some degree be a common aspect of measures falling within the scope of one or another of the exceptions (a) to (j) of Article XX*"[99]. The AB then went on to set out a number of tests that measures would have to satisfy in order to comply with GATT, most notably the need to demonstrate a "sufficient nexus", the requirement to take into account the economic and technological conditions of other WTO Members and the requirement for good faith before the adoption of such a measure. Whilst the *shrimp-turtle* case is generally considered to recognise the

---

[94] The Panel found that the measures therefore fell under, and were inconsistent with, Article XI as an import prohibition. (The measure was not considered to be subject to one of the Article XX exemptions.) See tuna-dolphin I, Section 5.B Prohibition of imports of certain yellowfin tuna and certain yellowfin tuna products from Mexico: Categorization as internal regulations (Article III) or quantitative restrictions (Article XI).
[95] Tuna-dolphin I, op cit., at 5.15
[96] Tuna-dolphin I, op cit., at 5.23
[97] Winter, 2003, op cit.; Mann and Porter, 2003, op cit.; Gaines, 2002, op cit.
[98] *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, Report of the Panel, WT/DS58/R, May 15, 1998. *United States – Import Prohibition of Certain Shrimp and Shrimp Products*, Report of the Appellate Body, WT/DS58/AB/R, October 12, 1998.
[99] Report of the Appellate Body, ibid. at para. 121.

potential justification of PPMs in the WTO[100], the AB found that in fact the **implementation** of the measure was inconsistent with GATT since it constituted arbitrary discrimination. Despite the apparently more inclusive recognition of the applicability of PPM measures it is difficult to envisage a situation where such a measure would be allowed to stand in light of these findings.

The final case to consider is the *EC-asbestos* case.[101] This case concerns risks to human health. In that case the AB considered whether the health impacts of asbestos could be included in an analysis of whether asbestos containing products and non-asbestos products were 'like'. This was an opportunity to determine whether risks to health and life, an important objective of Biosecurity, could be used to distinguish products as 'unlike'. Though the AB held that the carcinogenic nature of asbestos was a defining physical characteristic of the product, it did not rule on whether the products were 'like' on the basis of lack of evidence.

The decisions discussed above may be considered to have gradually increased the potential for PPMs to be held compatible with WTO measures.[102] However, although the AB has indicated that such measures might be acceptable, in both the *shrimp-turtle* and *EC-asbestos* cases it found reasons not to uphold the measures. The area, therefore, remains unclear.[103] This issue is therefore another that may be relevant to the implementation of Biosecurity frameworks. Whilst the desire to regulate risks to health and to protect the environment might include regulations concerning how products have been produced or processed, the extent to which such measures will be allowed under

---

[100] Mann and Porter, 2003, op cit.; IISD, *Trade and Environment: An introduction to understanding and promoting sustainable trade in the WTO*, Newly Independent States WTO/NCSD Project, Background Paper prepared by the International Institute for Sustainable Development, September, 2002; RING, IISD, *Standards for Sustainable Trade*, A RING-IISD Capacity Building Project, Background Paper 1, IISD, 2002; Isaac and Kerr, 2003, op cit.
[101] *European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, Report of the Appellate Body*, WT/DS135/AB/R, March 12, 2001.
[102] See also Hoberg, George, 'Trade, Harmonization, and Domestic Autonomy in Environmental Policy', *Journal of Comparative Policy Analysis*, vol. 3, no.2, 2001, pp.191–217.
[103] Stilwell and Tarasofsky, 2001, op cit.; Mann and Porter, 2003, op cit.; Winter, 2003, op cit.

international trade law remains unclear, but appears to be narrow. Potentially, the ability to distinguish products based on PPM could be an important tool in achieving Biosecurity objectives, particularly in light of the 'race to the bottom' arguments. Though such measures do have the potential to be used for protectionist purposes, the PPM debate illustrates the possible importance for states to include social, environmental and economic factors in risk management decisions and that in implementing Bisoecurity measures states may wish to include factors other than those based on science.

An issue related to the general problem of PPMs is that of eco-labelling. The rationale behind eco-labelling is primarily to allow a distinction between products that do or do not conform to particular standards and to allow the consumer to make a choice as to which products to support.[104] In practice problems may arise. UNEP notes that "*most ecolabelling schemes are national programmes, developed for domestic economic and environmental realities, and consider domestic environmental preferences*"[105]. The problems can be especially important for developing countries. Tom Rotherham notes that exporters "*may be forced to satisfy environmental requirements or adopt policies that have no relevance to them*"[106]. Where developing countries are concerned this might have a significant economic impact in relation to exports whilst having an insubstantial or inappropriate impact on protection of environment and/or health.

Eco-labels will also be problematical when they constitute unjustified trade barriers. A particular issue is that since eco-labels are sometimes based on the life cycle of the product, incorporating the 'cradle-to-grave' approach to regulation, they constitute a non-product PPM and will therefore be subject to

---

[104] Brittan, Sir Leon, 2000, op cit.; UNEP and IISD, 2000, op cit.; Tian, Huilian, 'Eco-labelling Scheme, Environmental Protection and Protectionism', *Canadian Journal of Economics*, vol. 36, no. 3 August 2003, pp. 608–633.
[105] UNEP and IISD, 2000, op cit., p48.
[106] Rotherham, Tom, *Selling Sustainable Development: environmental labeling and certification programs*, Conference Paper, Meeting of Technical Specialists and Policy Experts on Environmentally-Sound Trade Expansion in the Americas, The Dante B. Fascell North-South Center University of Miami, October 28–29 1999. p. 16. See also UNEP and IISD, 2000, op cit.; IISD, 2002, op cit.

the problems of the issue of 'like' products as discussed above.[107] In the context of eco-labelling the non-product PPM debate takes on another facet, namely that eco-labels allow consumers to make a distinction between products based on PPMs. However, where the labelling scheme is voluntary the WTO Member itself might not be considered to be creating an unjustifiable barrier to trade: products not carrying the eco-label will be imported without distinction from those that do carry the eco-label, in the case of most voluntary schemes.[108]

There are two types of eco-labels: those that are voluntary standards and those that are essentially mandatory requirements, usually in the form of a government authorised scheme.[109] The TBT Agreement provides requirements for non-discrimination of 'technical regulations' and 'standards'. Both of those terms include labelling requirements. The term 'technical regulation' applies only to mandatory requirements. The term 'standard' applies to measures where compliance is not mandatory. The two types of labelling requirement are therefore subject to the relevant requirements of the TBT Agreement as well as to the provisions of the GATT, including the principles of most-favoured nation treatment and national treatment, discussed above.

It can be seen that again there is potential for conflict between international agreements and principles specifically related to Biosecurity. Eco-labels may be useful in encouraging adherence to particular standards. For the purposes of Biosecurity these types of standards may be useful in encouraging the protection of the environment or to provide an alternative way to manage risks to plant and animal life and health. However, the extent to which eco-labels can be legitimately used is unclear. The mandate of the CTE specifically includes consideration of the "*relationship between the provisions of the Multilateral Trading System and requirements for environmental purposes relating to products, including standards and technical regulations, packaging, labelling*

---

[107] Stilwell and Tarasofsky, 2001, op cit.; Rotherham, 1999, op cit.; IISD 2002, op cit.; Ward, Halina, 'Trade and Environment Issues in Voluntary Eco-labelling and Life Cycle Analysis', *Ecolabelling and Life Cycle Analysis*, vol. 6, issue 2, 1997, pp.139–147.

[108] See UNEP and IISD, 2000, op cit. and Basu, Arnab K, Chau, Nancy H and Grote, Ulrike, 'Eco-Labelling and Stages of Development', *Review of Development Economics*, vol. 7, no. 2, 2003, pp.228–247.

and recycling"[110]. However, to date, there appears to have been little progress in this area [111] and the CTE has issued no recommendations pursuant to this item of the agenda, though the WTO has stated that the issue of labelling related to how a product was made is in need of "*further discussion*"[112]. The extent to which eco-labels and certification schemes can be used is unclear and WTO Members must consider the implications of using such schemes for the purposes of managing Biosecurity.

1.3.4 The role of science and the Precautionary Principle

The extent to which science-based risk assessment must be used or the precautionary principle applied has important consequences for the regulation of Biosecurity. It can be seen from the above analysis of relevant WTO Agreements that there is a specific requirement for decisions to be based upon risk assessment. However, when regulating risks to human, animal and plant health and the environment it has been argued that this approach to risk analysis is not always sufficient to provide an adequate level of protection.

The literature generally recognises that the importance and extent of consideration of the precautionary principle increased throughout the 1990s so that it is now an internationally recognised principle, though its position as a norm of international law is disputed.[113] The generally accepted 'definition' of the principle can be found in Principle 15 of the Rio Declaration[114], the first international instrument expressly to include provision for precaution-based decision-making.[115]: "*In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific*

---

[109] Ward, 1997, op cit.
[110] See <http://www.wto.org/english/tratop_e/envir_e/cte00_e.htm>, op cit. See also the Ministerial Decision on Trade and Environment, op cit.
[111] IISD, 2002, op cit. See also CTE, 'Report (1996) of the Committee on Trade and Environment' WT/CTE/1, November 1996, Item 3(b).
[112] WTO, 2003, op cit.
[113] Mann and Porter, 2003, op cit. See also discussion at section 1.2.
[114] Rio Declaration on Environment and Development 1992.
[115] The precautionary principle is found or alluded to in a number of international agreements, see, for example, the Convention on Biological Diversity (Preamble); CITES; the UN Framework Convention on Climate Change 1992, Article.3(3); the Cartagena Protocol on

certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation".

The central issue of the precautionary principle is, under what circumstances it is acceptable for states to take measures to regulate or manage risks where there is a lack of scientific certainty or data about the extent of that risk. As identified by UNEP[116] and Donna Roberts *et al.*[117] such measures may constitute disguised protectionism and conflict with the principles of the GATT. The WTO's response to this has been to require that apart from not constituting unjustified trade restrictions generally, decisions for the management of risks to human, animal and plant health and the environment should be based on scientific evidence and risk assessment (see below). However, as noted by Peter Hardstaff, in an RSPB publication, there is a problem with this requirement because "*there is currently no 'one-size-fits-all' approach to risk management*"[118]. This argument identifies the fact that what one state may consider to be a minor risk another state may consider to be a serious risk and in such a situation it is difficult simply to rule out the application of precautionary measures.

A further essential aspect of the debate is the nature of scientific knowledge and the extent to which 'full scientific certainty' is a valid concept. The precautionary principle addresses the absence of certainty in scientific knowledge[119], including those situations in which relevant scientific evidence is incomplete and also those situations in which policy decisions must be made and scientific evidence alone is insufficient for that purpose. The existence of such situations in reality is illustrated by Giovanni Immordino: "*Just think of the scientific uncertainty that has accompanied AIDS, the greenhouse effect, low radiation exposures, genetically modified organisms (GMO), or mad cow*

Biosafety (preamble). The Rio declaration is generally accepted as producing the precautionary principle as it is known today.

[116] UNEP and IISD, 2000, op cit.

[117] Roberts, Orden and Josling, 1999, op cit.

[118] Hardstaff, Peter, *The Precautionary Principle, Trade and the WTO*, A Discussion Paper for the European Commission Consultation on Trade and Sustainable Development, Royal Society for the Protection of Birds, (RSPB) 2000.

disease (BSE)"[120]. Thus when it is said that decision making should be based on 'sound science' or scientific risk assessment it must also be recognised that these concepts themselves may not be capable of providing sufficient information and are limited by the capabilities and interests of science at a particular time.[121] Arguments for the use of scientific risk assessment may also be based on a misunderstanding, or misrepresentation, of the nature of that risk assessment. This is recognised by Holt *et al.* who comment:

> "*The guidelines given in the World Trade Organisation SPS Agreement that the risk assessment should be based on scientific principles and evidence might foster a false understanding that risk assessment is objective and quantitative. In fact, such risk assessments are predictions involving expert judgment with associated uncertainty. When risk assessment outcomes are communicated in the context of such uncertainty, however, decision makers in the regulatory authority may feel that a clear conclusion has not been provided (EFSA 2006)*"[122].

The desirability of states to be able to apply precaution in the decision making process has been widely expressed in the literature, including that generated by the WWF, the RSPB and UNEP who consider that where there are important potential effects of not applying a precautionary approach or where the current state of knowledge is insufficient, the principle should be applied.[123] UNEP notes that "*as the scale of possible damage increases, so does the need to act with precaution*"[124].

The problem with applying the approach provided by Principle 15 is that it has not been uniformly recognised and applied and it will be seen that this can cause problems when applying international agreements. The CBD appears to take a precautionary approach, providing in the preamble that:

---

[119] Immordino, Giovanni, 'Looking for a guide to protect the environment: the development of the precautionary principle', *Journal of Economic Surveys*, vol. 17, no. 5, 2003, pp.629–643.
[120] Immordino, ibid, p.631.
[121] The counter-argument to this is that excessive risk-aversion, sometimes associated with or as being inherent in the application of the precautionary principle, is detrimental to the economy and restricts innovation. For discussion see Gollier, Christian, 'Precautionary principle: the economic perspective', *Economic Policy*, vol. 6, no. 33, October 2001, 301–328.
[122] Holt, J., Black, R.., and Abdalla, Roshan, 'A rigorous yet simple quantitative risk assessment method for quarantine pests and non-native organisms' *Annals of Applied Biology* (accepted for publication).
[123] UNEP and IISD, 2000, op cit.; Hardstaff, 2000, op cit.; Stilwell and Tarasofsky, 2001, op cit.
[124] UNEP and IISD, 2000, op cit.

"*...It is vital to anticipate, prevent and attack the causes of significant reduction or loss of biological diversity at source...*

Noting also that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat".

CITES can also be seen to embrace the precautionary principle. Though CITES does contain provisions for the use and application of scientific data, the overall ethic of the Convention incorporates a precautionary approach to risk. This can be seen in the general provisions and principles of the CITES. For example, Appendix III provides for the inclusion of species which "*any Party identifies as being subject to regulation within its jurisdiction for the purpose of preventing or restricting exploitation*". The species does not have to be recognised as being threatened or at risk as is the case of species in Appendix I and Appendix II. This implies that Contracting Parties are encouraged to take a prudent or precautionary approach to the regulation of species in order to prevent them from becoming endangered, rather than waiting until they are officially endangered or until they are regulated under the Convention. It can be seen then that the relevant MEAs support a precautionary approach to regulation and decision making.

The approach of the WTO, however, differs from that of MEAs. Whilst the MEAs incorporate the precaution-based approach established in the Rio Declaration, the WTO Agreements maintain that decisions must be based on risk assessment and scientific evidence, the approach that has sometimes become known as the 'sound science' approach, as discussed by Hardstaff.[125] Article 5.7 of the SPS Agreement appears to provide some scope for the application of precaution but in fact this provision has been one of the most controversial in terms of determining the extent to which the precautionary

[125] A particular tension between the precautionary principle and the SPS Agreement is noted by Hardstaff, 2000, op cit. For further discussion of this approach and its relationship to the precautionary approach see Weiss, Charles, 'Scientific uncertainty and science based precaution', *International Environmental Agreements*, vol. 3, no. 2, 2003, pp.137–166

principle can be applied. The problem for Biosecurity lies in the fact that again there appears to be a conflict between states obligations under international trade agreements and the requirements of MEAs.[126]

The WTO acknowledges that "*countries must establish SPS measures on the basis of an appropriate assessment of the actual risks involved*" but also states that "*the SPS Agreement clearly permits the precautionary taking of measures when a government considers that sufficient scientific evidence does not exist to permit a final decision on the safety of a product or process*"[127]. This approach seems somewhat contradictory even in light of the scope of Article 5.7 of the Agreement. The EC supports the idea that the precautionary principle is expressly recognised in the principles of international law, including in WTO Agreements.[128] The application of the precautionary principle is, in fact, specifically enshrined in Article 174 (ex 130(r)) of the EC Treaty which states, "*Community policy on the environment shall aim at a high level of protection taking into account the diversity of situations in the various regions of the Community. It shall be based on the precautionary principle and on the principles that preventive action should be taken*". The circumstances in which this policy will be applied are elaborated on in Article 174(3): "*In preparing its policy on the environment, the Community shall take account of: available scientific and technical data; environmental conditions in the various regions of the Community; the potential benefits and costs of action or lack of action; the economic and social development of the Community as a whole and the balanced development of its regions*". Article 174(3) limits the potential application of the precautionary principle by requiring policy to take account of scientific and technical data but it also explicitly recognises that this alone will be insufficient for the purposes of environmental regulation and policy.[129]

Whilst this is powerful authority concerning the international recognition of the principle the fact remains that the precautionary principle or the scope for

---

[126] Stilwell and Tarasofsky, 2001, op cit.
[127] See WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, op cit.
[128] See Commission of the European Communities, Brussels, 02.02.2000 Com (2000) 1, Communication from The Commission on the precautionary principle.
[129] Consolidated Version of the Treaty Establishing the European Community

taking precautionary measures is not expressly recognised in any WTO Agreements. UNEP notes that the SPS Agreement does observe, to some extent, the need for precaution.[130] The scope for this is very limited since it does not expressly refer to precaution-based decision-making but allows for the adoption of provisional measures in light of pertinent information. In practice this is a much more restrictive approach than that generally accepted as the precautionary principle. By contrast, the application of the precautionary principle is considered to be "*a cornerstone of many MEAs*"[131].

It can be seen that there is a potential problem for states attempting to implement effective Biosecurity frameworks. A state may consider that the approach to a particular risk, such as the introduction of a particular alien species, or a particular food safety measure, should be subject to a precautionary approach. The obligations of the state under WTO Agreements may prevent it from taking a precautionary approach because there is insufficient evidence for the approach or because it is not sufficiently based on risk assessment. Alternatively, or in contrast, the obligations of the state under MEAs may encourage a precautionary approach, for example to prevent adverse affects on the conservation of biodiversity.

Mann and Porter consider in detail a number of cases dealing with the application of the precautionary principle.[132] Those cases are the *beef-hormones* case, the *Australian salmon* case,[133] the *Japanese varietals* case[134] and, most recently, the *Japan-apples* case.[135] In the *beef-hormones* case the AB recognised that "*responsible, representative governments commonly act from perspectives of prudence and precaution where risks of irreversible ...damage*

---

[130] UNEP and IISD, 2000, op cit.
[131] Stilwell and Tarasofsky, 2001, op cit.
[132] Mann and Porter, 2003, op cit.
[133] *Australia – Measures Affecting Importation of Salmon*, Report of the Appellate Body, WT/DS18/Ab/R, October 20, 1998.
[134] *Japan – Measures Affecting Agricultural Products*, Report of the Appellate Body, WT/DS76/AB/R, February 22, 1999.
[135] *Japan – Measures Affecting the Importation of Apples*, WT/DS/245/R, July 15, 2003, Report of the Panel.

to human health are concerned"[136]. The AB considered, however, that without a "*clear textual directive*"[137] the normal provisions of the SPS Agreement must be applied; the precautionary principle did not overrule the provisions of the SPS Agreement.[138] Despite this, Mann and Porter consider that there is now scope for the application of the precautionary principle, particularly in light of the AB's decision that risk assessment must be based on that which actually exists in the real world, not just what is found in the laboratory.[139] The authors argue that the approach of the AB to the issue of scientific uncertainty "*clearly establishes that the choice of measure can be based on new scientific opinion, on a minority opinion or on a majority opinion that is not unanimous*"[140]. This argument does seem to be consistent with the broad intentions of the AB in its analysis of the precautionary principle and its relationship with the SPS Agreement. The authors go on to argue that the *Australian salmon* case and the *Japanese varietals* case do not alter the decision in *beef-hormones* to any significant extent and that following the *Japan-apples* case, "*when these cases are considered as a whole, the AB makes it clear that what is not acceptable under the SPS Agreement is to 'invent' or establish risk based on the pp*" and that the scope for the application of the precautionary principle in the DSU has been acknowledged and accepted.[141]

This interpretation of the cases may be slightly generous but it is accepted that the scope for the application of the precautionary principle has been apparently widened following these cases, particularly *beef-hormones.*[142] However, the *Japan-apples* case may restrict this approach to some extent. As discussed by Mann and Porter, the view of the Panel — that the evidence should have supported the view that the apples in question "*are likely*" to serve as a pathway for the recognised risk — may have the potential to impose a requirement for

---

[136] *EC – Measures Concerning Meat and Meat Products (Hormones)*, Report of the Appellate Body, op cit., paragraph 124.
[137] *EC – Measures Concerning Meat and Meat Products (Hormones)*, Report of the Appellate Body, ibid.
[138] This approach is consistent with the Vienna Convention on the Law of Treaties
[139] See Mann and Porter, 2003, op cit.
[140] See Mann and Porter, 2003, ibid. p.30.
[141] Mann and Porter, ibid. See p.35.
[142] See Weiss, 2003, op cit.

the recognition of a particular level of risk in decision making.[143] This would move away from the precautionary principle and towards a strict interpretation of the provisions of the SPS Agreement.[144]

The possibility of increasing formal recognition of the precautionary principle has been introduced following the conclusion of the Fourth WTO Ministerial Conference in Doha in 2001. Section 6 of the Ministerial Declaration states:

> *"We recognize that under WTO rules no country should be prevented from taking measures for the protection of human, animal or plant life or health, or of the environment at the levels it considers appropriate, subject to the requirement that they are not applied in a manner which would constitute a means of arbitrary or unjustifiable discrimination between countries where the same conditions prevail, or a disguised restriction on international trade, and are otherwise in accordance with the provisions of the WTO Agreements."*

No specific reference to the precautionary principle was made however, and, as was the nature of the Doha Declaration, no new or specific decisions or provisions elaborating the effect of this statement were made. Though the Doha Declaration indicates the increasing presence of precaution-based decision making on the international agenda the effect that it will have remains to be seen and is likely to be limited in light of the positive obligations set out in the SPS Agreement.

It is clear from this debate that the extent to which states can make decisions based on a precautionary approach is still unclear. States are subject to conflicting obligations under WTO Agreements and MEAs and the extent to which the principle will be applied in the event of a dispute is not subject to a rigorous interpretation. This leaves the issue of regulation of Biosecurity in an uncertain position. The cases indicate that precautionary measures, for example measures applied ostensibly for food safety purposes, may be upheld in a dispute but to date all of the cases have found such measures to be inconsistent with the relevant trade provisions. There are calls for a clarification of how the

---

[143] See Mann and Porter, 2003, op cit. p.34.
[144] Mann and Porter, 2003, ibid.

precautionary principle could be applied.[145] The current state of international law means that WTO Members may be restricted in the choices they can make concerning the regulation and management of risks to human, animal and plant health and life. The extent to which the application of the precautionary principle is restricted may have significant impacts on the extent to which states can effectively manage risk. For example, several states have "*noted the importance of prevention and the control of pathways, rather than dealing with invasive species once they have become established*"[146].

1.3.5 Biotechnology

The area of biotechnology is of particular relevance to Biosecurity because it affects all areas of Biosecurity and is affected by all of the trade-environment issues discussed above. Biotechnology potentially affects human, animal and plant life and health and the environment. A number of uses for biotechnology have been developed and of particular importance to Biosecurity is its use in agriculture, forestry and fisheries. In March 2000, in a Statement on Biotechnology, the FAO noted that biotechnology has the potential to bring a number of improvements and benefits particularly to food security through increased production and productivity.[147]

Extensive debate and discussion has focused on the potential risks associated with biotechnology. These risks can be related to live modified organisms (LMOs) or products of LMOs such as food and animal feed.[148] The FAO comments that the risks associated with biotechnology fall into two basic categories, "*the effects on human and animal health and the environmental consequences*"[149]. The FAO offers a concise summary of these risks:

---

[145] See CTE TE/033, op cit. and ICTSD, IUCN and CEESP, 'Workshop 2: Risk, Precaution and Biosecurity'. *Bridges; Trade BioRes —Trade and Biological Resources News Digest*, Special Issue; Bridging Worlds —Trade, Biodiversity and Sustainable Development, 8 September 2003, pp.4–6.

[146] ICTSD, IUCN and CEESP, ibid., p.4.

[147] FAO, Biotechnology in Food and Agriculture, Statement on Biotechnology, March 2000. <http://www.fao.org/biotech/stat.asp> (03/08/2006)

[148] The distinction between live modified organisms (LMOs) and Genetically Modified Organisms (GMOs) is still somewhat unclear. The terms are sometimes used inter-changeably. The Cartagena Protocol on Biosafety applies only to LMOs.

> "*Caution must be exercised in order to reduce the risks of transferring toxins from one life form to another, of creating new toxins or of transferring allergenic compounds from one species to another, which could result in unexpected allergic reactions. Risks to the environment include the possibility of outcrossing, which could lead, for example, to the development of more aggressive weeds or wild relatives with increased resistance to diseases or environmental stresses, upsetting the ecosystem balance. Biodiversity may also be lost, as a result of the displacement of traditional cultivars by a small number of genetically modified cultivars, for example*"[150].

One reason for the extent of the current debate is that the effects and implications of biotechnology are not considered to be fully understood. The particular problems for Biosecurity can be seen to arise at least partly through the rapid expansion of the biotechnology industry before suitable regulatory and management frameworks have been implemented.[151] In order to manage effectively the risks associated with biotechnology, states must implement effective regulatory frameworks, including the development of infrastructure and technical capacity.[152]

In an attempt to address some of the main issues related to the use of biotechnology the Cartagena Protocol on Biosafety was finally implemented in September 2003. The Protocol had previously received some criticism especially following the collapse of negotiations in 1999. The overall purpose of the Protocol is to provide a general international framework for the regulation of LMOs. Since the Biosafety Protocol is a protocol of the CBD it also has the objective of preventing adverse effects on Biodiversity (see Preamble). The provisions of the Protocol, particularly the Advanced Informed Agreement Procedure and the Biosafety Clearing House, provide for a system of notification and consent for the movement and handling of LMOs and LMO products. The Biosafety Protocol has important implications for the management of risks related to GMOs but it does not cover all elements of Biosafety. In fact, it has been criticised for its lack of treatment of safety

---

[149] FAO, Statement on Biotechnology, 2000, op cit.
[150] FAO, Statement on Biotechnology, 2000, ibid.
[151] Falkner, Robert, 'Regulating Biotech Trade: The Cartagena Protocol on Biosafety', *International Affairs*, vol. 76, no. 2, April 2000, pp. 299–313.

measures and emphasis on trade and transfer.[153] As with the international agreements seen above, Parties are responsible for national implementation of the Protocol and thus ensuring an effective Biosafety framework compliant with international obligations.

There are a number of trade-environment issues that remain in need of clarification for the purposes of Biosafety. The issue of PPMs generally and of labelling requirements remains unclear. The issue of whether GMO and non-GMO products can be treated as 'like' products remains open to debate. The issues are highlighted by Grant Isaac and William Kerr, who note that,

> "*the first important issue to deal with is whether or not the use of modern genetic modification techniques constitutes a PPM...on one hand, the techniques and procedures of genetic modification are used in the development of the seed, but not in the growth of the seed after planting... those GM seeds may then be grown in the same intensive production system using the same PPM for non-GM crops. According to this argument, GM crops would not have different PPM than non-GM crops and, therefore would be substantially equivalent or 'like' products. On the other hand, it is argued that it is the use of the genetic modification techniques that makes GM crops inherently different from non-GM crops and, therefore, would not be substantially equivalent to non-GM crops*"[154].

A further argument is that it is the potential effect of GMOs (or specifically, LMOs) **after** the initial PPM process and the product's subsequent release that may distinguish, for example GM crops from non-GM crops. This is because it is the novel environmental effects of the crop, such as possible effects on biodiversity, which prevent GM and non-GM crops being considered 'like' products.

The issue of labelling is also contentious. The SPS Agreement allows for labelling requirements "*directly related to food safety*"[155]. The TBT Agreement allows for technical regulations that may restrict trade where they fulfil a legitimate objective, including "*protection of human health or safety, animal or*

---

[152] FAO, Biotechnology in Food and Agriculture, FAO's Activities in the Field of Biotechnology <http://www.fao.org/biotech/act.asp> (03/08/2006)
[153] See, for example, Gopo, Joseph, M., *Biosafety and Trade issues for Developing Countries*, ICTSD Workshop on Biotechnology, Biosafety and Trade: Issues for Developing Countries, Bellevue: Switzerland, 18–20 July 2001.
[154] Isaac and Kerr, 2003, op cit., p.36.

plant life or health, or the environment"[156] (based on scientific risk analysis as seen above). It seems that there may be some opportunity for mandatory labelling of GMO products under the WTO Agreements but what is almost certainly not covered is mandatory labelling of GMO products for the purpose of consumer awareness.[157] This has been an important area of debate and is linked to issues of food safety and consumer perceptions and preferences and consequently to Biosecurity.

Another trade-environment debate affected by the Biosafety Protocol is that surrounding the Precautionary Principle. The preamble of the Protocol 'reaffirms' the precautionary principle as set out in the Rio Declaration. Article 1 sets out objectives that are "*in accordance with the precautionary principle*". The practical implementation of the precautionary principle appears, however, to be more complex. Article 10 provides that "*lack of scientific certainty due to insufficient relevant scientific information and knowledge regarding the extent of the potential adverse effects of a living modified organism on the conservation and sustainable use of biological diversity*" shall not prevent importing parties from taking decisions related to the import of LMOs to avoid or minimise potential adverse effects. Article 15 requires importing parties to undertake risk assessments for the purpose of decision making under Article 10 and also requires that such assessments are carried out in a "scientifically sound manner".

These differing provisions reflect the difficulties encountered by Contracting Parties with differing interests in agreeing on the final text of the Protocol and the compromise that was finally accepted.[158] Robert Falkner comments that the Protocol "*failed to resolve the underlying conflict between international environmental regulation and the WTO's trade rules*"[159]. It can be seen that the provisions of the Protocol are somewhat vague and the extent to which a precautionary approach could in fact be adopted, in light of the need for

---

[155] Annex A: Definitions, Section 1.
[156] Article 2.2
[157] Isaac and Kerr, 2003, op cit.
[158] For discussion of the development of the Cartagena Protocol see Falkner, 2000, op cit.

science-based risk assessment, is debatable. This lack of clarity means that it may be difficult for Contracting Parties to determine the extent to which a precautionary approach can be adopted and to which specific measures will be compliant with the Protocol.

[159] Falkner, 2000, ibid., p.313.

1.4 INTERNATIONAL STANDARDS FOR BIOSECURITY MEASURES

1.4.1 Introduction to international standards for Biosecurity

International agreements relevant to Biosecurity have been reviewed because they provide the overarching principles and obligations that must inform the development of national Biosecurity frameworks. Particular issues concerning the interaction between environmental and trade agreements have been reviewed, firstly because some of the uncertainties and potential conflicts arising in these areas are relevant to national Biosecurity frameworks, and secondly, because they have been subject to a level of research and debate that has not occurred specifically in the component fields of Biosecurity. There are, however, international standard-setting agencies for plant health, animal health and food safety and these directly influence the content and approaches of national Biosecurity frameworks, particularly since the introduction of the SPS Agreement.[160]

As has been established above,[161] Biosecurity encompasses plant, animal and human health and safety and environmental protection while international agreements have a number of broad implications for national Biosecurity frameworks. A number of more specific influences on and characteristics of national Biosecurity frameworks exist and will be briefly examined. The components are currently heavily influenced by WTO principles. National Biosecurity frameworks seek to achieve an appropriate level of protection for human, animal and plant health but also to maintain and/or expand access to international export markets. This is a particular concern for developing countries that often have agriculture based economies and are seeking to increase revenue derived from agricultural exports. As has been seen (in section 1.1), traditionally national governments have regulated the components of Biosecurity on a sectorial basis with different bodies and statutory provision for plant health, animal health and food safety.

---

[160] See FAO, Rome 2003, op cit.
[161] See sections 1.1 and 1.2

Environmental protection is generally a separate area of regulation, often falling within a national Department of Environment. In this respect, environmental protection at the national level includes protection and conservation matters that are broader than the general concerns of Biosecurity (for example, forestry protection may include not only measures for the prevention of invasive species but also controls on logging and the use of certain types of timber). For this reason, frameworks for environmental protection will not be expressly considered. As has been seen, in Biosecurity various environmental protection issues are related to measures for the protection of plant and animal health and will be considered in this capacity. The control of pesticides is also important. This is not only because pesticides control is relevant to the protection of human, animal and plant health generally but also because regulation of trade in pesticides and agricultural production using pesticides may be required by those countries mainly dependent on imported pesticides (most developing countries, for example). In these cases, the control of pesticides, as with other components of Biosecurity, takes place within the context of international trade. For example, where standards specify Maximum Residue Limits associated with particular pesticides, implementation of a number of measures may be needed to ensure that these levels are complied with (see below, page 63), as well as for domestic Biosecurity objectives.

There are various types of measure which states may wish to adopt in order to maintain the desired level of plant and animal health and for food safety. As discussed above (sections 1.2 and 1.3), in accordance with the SPS Agreement national sanitary or phytosanitary measures must be based on scientific risk analysis (demonstrating the need for a measure to prevent harm). There is an issue, in this respect, about the use of technology and standards. Though developing countries may be aware of the need for risk analysis, the technology and infrastructure required for this may be difficult to achieve due to limited resources and technical capacity. The standards and guidelines described below are applicable to all Members but it is important to consider the extent to which the implementation of these standards is practical for Members with different

levels of development (as well as different cultural and legal climates) (see section 1.5 below).

In the areas of plant health, animal health and food safety, international bodies play a role in setting international standards applicable to the application of sanitary or phytosanitary measures for these areas. These bodies are: for plant health, the International Plant Protection Convention (IPPC), through the IPPC Secretariat; for animal health, the World Animal Health Organisation (OIE); and for food safety, the Codex Alimentarius Commission (Codex). These bodies and the standards and texts developed by them are significant because they are recognised by the WTO as being internationally acceptable standards for WTO Members.[162] Indeed, under the relevant WTO Agreements, Members must base national measures on these international standards or otherwise justify them on the basis of risk analysis, as described.[163] This is important because it means that national measures based on the adoption of, and compliance with, these standards will be recognised as based on risk analysis and as being compliant with WTO-GATT principles. These three bodies identify their role as protecting the level of health in their respective areas whilst ensuring that sanitary or phytosanitary measures (as applicable) are not used as unjustified trade barriers.[164] On this basis, the standards developed are based on risk analysis and measures imposed by Members are required to be necessary, technically justifiable and reflect the WTO-GATT principles of non-discrimination and the need to adopt least-trade-restrictive measures. In the

---

[162] See IPPC, *Guide to the International Plant Protection Convention*, 2000 (available at <https://www.ippc.int/servlet/BinaryDownloaderServlet/26227_Guide2002_English.pdf?filename=1063264041495_IppcGuide02eb.pdf&refID=26227>) (03/08/2006);
FAO, *Understanding the Codex Alimentarius*, WHO-FAO Publication, Rome 2005 available at <http://www.fao.org/docrep/008/y7867e/y7867e00.htm> (03/08/2006);
OIE, *What is the OIE?*, at http://www.oie.int/eng/oie/en_oie.htm (03/08/2006);
Vallat, B, 'Role of the International Organisation for Animal Health (Office des Epizooties: OIE) in the Control of Foot and Mouth Disease', *Comparative Immunology, Microbiology and Infectious Diseases*, vol. 2, issues 5–6, 2002, pp.383–392 and Black, R, 2003, op cit.

[163] For further discussion see Black, R, 2003, op cit.

[164] See, for example, IPPC 2002, op cit.; the International Plant Protection Convention, Revised Edition 1997; FAO, 2005, op cit.; OIE, *What is the OIE?*, op cit.

case of the IPPC in particular the scope of work is not limited to traded commodities only but includes also the protection of wild flora.[165]

The IPPC framework is based on the Convention, the present version of which was revised in 1997 and on the more specific International Standards for Phytosanitary Measures (ISPMs). In the case of the OIE, the main documents are the Terrestrial Animal Health Code, (TAHC) which sets out principles and standards generally as well as for specific diseases, and the accompanying Manual of Diagnostic Tests and Vaccines for Terrestrial Animals (the Terrestrial Manual), which provides relevant standards, and the equivalent documents for aquatic animal health. The Codex Alimentarius is a collection of standards, codes of practice, guidelines and other recommendations setting out both more general principles, for example the Codex General Principles of Food Hygiene, and specific standards, for example, MRLs or commodity-based standards.[166] Draft standards may be submitted by Member states and are usually prepared by the respective commissions. These should then be adopted by the Members. Although there is a vast range of standards, many of which are extremely specific, there are also a number of principles and standards developed by all of three of the institutions which are relevant to the development of national Biosecurity frameworks. The measures most relevant for the present purposes and which provide a general overview of common characteristics of national Biosecurity frameworks are summarised below.

1.4.2 Competent authorities

One important feature is the need for a competent authority or authorities, with responsibility for plant health, animal health, food safety, or a combination of these. One reason that such an authority is needed is to ensure that there is a contact point which can act as a link between the Member state and the relevant institution. This is provided for in the Procedural Manual of the Codex

---

[165] See IPPC 2002, ibid., p.3 and IPPC, Summary of the IPPC, 2001 (available at <https://www.ippc.int/servlet/CDSServlet?status=ND0zNzk1OSY2PWVuJjMzPSomMzc9a29z .>) (03/08/2006)

[166] See FAO, 2005, op cit.

Alimentarius Commission.[167] The TAHC provides that communication between the OIE and the Member state should be through the Veterinary Administration of that state (Art. 1.1.1.1). The IPPC 1997 requires Contracting Parties to make provision for a National Plant Protection Organisation (NPPO) (Art. IV (1)). In all cases, the official contact point is usually the relevant regulatory authority in the Member state (for example, the NPPO may be the Plant Health Authority).

As well as acting as a contact point and facilitating information exchange with these international bodies, there must also be a relevant authority or authorities in-country, which is/are able to administer and enforce the relevant national measures. The IPPC 1997 (Art IV) sets out the responsibilities of the NPPO which include:

- the issuance of phytosanitary certificates;
- surveillance with the object of reporting the occurrence, outbreak and spread of pests, and controlling those pests;
- inspection of consignments of plants and plant products and regulated articles with the objective of preventing the introduction and/or spread of pests;
- disinfection or disinfestation of consignments to meet phytosanitary requirements;
- protection of endangered areas and the designation, maintenance and surveillance of Pest Free Areas and areas of low pest prevalence;
- the conduct of Pest Risk Analysis to ensure phytosanitary security of consignments after certification, prior to export;
- training and development of staff.

These responsibilities, with respect to import systems, are reiterated in ISPM 20.[168] Similar activities are identified as necessary components of control systems in the relevant Codex and OIE texts and therefore reflect a need for a competent authority with such responsibilities. In all cases, the relevant standards demonstrate recognition of the need for the competent authorities to employ or designate personnel (i.e. an inspectorate) who have been

---

[167] Codex Alimentarius Commission, 15th Procedural Manual, Section 2, 'Core Functions of Codex Contact Points' p.99.

appropriately authorised and who have the appropriate skills and/or qualifications to discharge their responsibilities (such as carrying out inspections, issuing certificates and taking action in cases of non-compliance).[169]

1.4.3 Regulated articles

For the purpose of maintaining adequate levels of protection, it may be necessary to regulate a wide range of articles, not only plant and animal species and food products. Pests, diseases and pathogens may enter a country or area via a wide range of pathways. For example, Vallat notes that there are risks of entry of foot and mouth disease associated not only with animals and their meat products but also with straw and fodder.[170] These, in turn, may represent higher or lower levels of risk and for this reason there may be a need to distinguish between different types of regulated article. The IPPC 1997 recognises two types of regulated pest: quarantine pests (pests of economic importance which are not yet present or are not widely distributed and which are being officially controlled) and regulated non-quarantine pests (pests whose presence in plants for planting has an unacceptable economic impact and which are regulated within the importing territory).[171] In order to prevent the entry of regulated pests a range of articles may be subject to phytosanitary restrictions and measures. These include any plants, plant products, storage places, packaging, container, conveyance, soil and any other organism, object or material capable of harbouring or spreading pests deemed to require phytosanitary measures. Under ISPM 20 all commodities may be regulated for quarantine pests but regulated non-quarantine pests can only be regulated with respect to plants for planting.[172]

---

[168] ISPM No. 20: Guidelines for a phytosanitary import regulatory system, 2004.
[169] See Terrestrial Animal Health Code (TAHC), Arts 1.2.1.3 and 1.2.2.3; ISPM No. 20 (ibid.), Arts. 4.6 and 5.2; Codex Guidelines for Food Import Control Systems Sections 3.6–8 and 3.10 and 4.41–43 and Codex Guidelines, for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems Sections 6. 19, 6.23 and 6.43
[170] Vallat, 2002, op cit., p.389.
[171] Definitions are provided in ISPM No. 5: Glossary of Phytosanitary Terms, 2005.
[172] Art. 4.1

The OIE provides for the control of 'listed diseases', which means any disease included in the list of transmissible diseases agreed by the OIE Commission (and set out in Chapter 2 of the TAHC), and 'notifiable diseases' which are those listed by the Veterinary Administration that, as soon as detected or suspected must be brought to the attention of the Veterinary Authority, in accordance with national regulations. 'Regulated articles' are not provided for but definitions are given for various commodities that may be disease vectors such as meat and meat products, milk and milk products. A similar approach is taken by Codex which provides definitions such as 'food', 'food product' 'contaminant' and 'pesticide residue'.[173] In the case of food safety, food products and their components including ingredients and artificial additives as well as contaminants may be the subject of regulation.

1.4.4 Certification and documentation

The operation of phytosanitary and sanitary measures, such as those described below, will often be based on the need for documentary evidence of compliance, for instance, affirmation that required procedures or conditions have been met. Exporting authorities may be required to issue certificates confirming conformity of commodities with import requirements. In recognition of the potential difficulties arising from the use of such certificates by different Member states, and the potential for these to be used as unjustified trade restrictions, the international institutions have provided standards concerning the use of certificates. In the case of the OIE, Model International Veterinary Certificates are provided in Part 4 of the TAHC. Principles for the drawing up of certificates are set out in Art. 1.2.2.2. The equivalent for plant health is the International Phytosanitary Certificate, models of which are provided in the IPPC 1997. Principles for the preparation and use of these certificates are provided in ISPM 12.[174] For food safety, Codex provides Guidelines for Generic Official Certificate Formats and the Production and Issuance of Certificates, which provides detailed guidance on the design and use of official and officially recognised certificates.

---

[173] See Codex Alimentarius Commission, 15th Procedural Manual (op cit.), Definitions for the Purposes of the Codex Alimentarius, pp.42–46.
[174] ISPM No. 12: Guidelines for Phytosanitary Certificates, 2001.

1.4.5 Import controls

One of the most important ways of maintaining desired levels of plant health, animal health and food safety, is to prevent the entry of relevant pests and diseases. Black comments, for example, that the foot and mouth disease outbreak in the UK in 2001 "*demonstrated in the most dramatic way for a generation the extent to which the health of livestock is threatened by harmful agents introduced from abroad in the form of pests such as insects and ticks and diseases*"[175]. As has been seen, controls may be applied to a variety of articles. In many countries pesticides are imported and import controls on pesticides may therefore be important in ensuring that the importing country itself is able to maintain compliance with the MRL requirements of importing countries, for example, by prohibiting certain pesticides or by attaching conditions to their entry such as labelling requirements and formulation information.

In compliance with the requirements of the SPS Agreement and general GATT-WTO principles a common feature of standards is the requirement that measures, including those applicable to imports, are both necessary (for the protection of health) and technically justified. Measures should be no more stringent than those applied within the importing country.[176] Under the TAHC and the IPPC 1997, measures should not be applied to pests or pathogens which are not subject to official control within the country.[177] It can be seen that these requirements reflect those found in the WTO-SPS Agreement.

In order to manage the risks associated with the entry of pests and diseases, import measures may prohibit the entry of a product into a country or may allow its entry subject to conditions.[178] For example, importing countries may require regulated articles to have been inspected prior to export to ensure they are free from specified pests, or have been subject to testing or analyses confirming freedom from certain contaminants or compliance with specified

---

[175] Black, R, 2003, op cit., p.179
[176] TAHC Art 1.2.1.2, IPPC 1997, Art. VI (1), Codex Guidelines for Import Control Systems Sections, op cit., 3.2–3.6.
[177] TAHC Art 1.2.1.2, IPPC 1997, Art VI (2)

levels for these. Imported commodities and articles may be subject to documentation checks, inspections and requirements for quarantine or treatment.[179]

Following these point-of-entry controls, the international texts provide that procedures should be in place for the decision-making and action that will be taken in the event of non-compliance. This may arise in cases in which certification is invalid or incomplete or where other import conditions are not met. The OIE provides that in cases of non-compliance with certification, the importing authority should notify the exporting authority immediately in order to provide an opportunity for correction.[180] Codex and the IPPC also require Members to provide timely advice to exporters regarding the basis of decisions with respect to compliance.[181]

In cases of non-compliance, including, under the OIE, cases in which the certificate cannot be corrected, or cases in which, following quarantine inspection or treatment a regulated pest or disease is confirmed, there are a number of options available to the importing authorities. The commodity may be refused entry and may be returned to the exporter under certain conditions. Alternatively, the commodity may be destroyed in circumstances in which it is too dangerous or impractical to re-export it. In other cases, the commodity may be permitted entry under certain further conditions.[182] For example, products for human consumption may be subject to treatment (TAHC, Art. 1.4.4.3). Codex also provides that such a commodity may be redirected for use other than for human consumption. Based on risk-assessment, import controls may also be applied to goods in transit through a country.[183]

---

[178] TAHC Art 1.4.4.3, IPPC 1997, Art. VII (1), ISPM No. 20, op cit., Art. 4.2

[179] See ISPM No. 20 (op cit.), IPPC 1997, Art. VII, TAHC Art 1.4.4.3 and 1.4.4.1 and Codex Principles for Food Import and Export Certification and Certification.

[180] TAHC Art 1.4.4.3

[181] Codex Principles of import and Export Inspection and Certification, op cit., section 3.15; IPPC 1997, Art VII (2) (f); ISPM No. 20, op cit., Art. 5.1.6.3.

[182] See TAHC Arts 1.4.4.3; IPPC Art. VII (1), ISPM No. 20, op cit., Art 5.1.6.1; Codex Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems, op cit., section 6.35; Codex Guidelines for Import Control Systems, op cit., section 4.27

[183] ISPM No. 20, op cit., Art 4.3; IPPC 1997 Art VII(4); TAHC 1.4.4.4

1.4.6 Export controls

To ensure that access to markets is maintained and to prevent exporters incurring the costs associated with non-compliance with import controls (such action will normally be taken at the exporter's expense), states may need to implement measures related to exports. The competent authorities of exporting Member states may need to undertake inspections, audits, sampling and analyses to verify that consignments conform to the requirements of the importing country. In this context, it is important that export systems and measures are reliable and provide valid assurances.

The TAHC provides that countries should only authorise exportation from their territory of animals which meet the requirements of the importing country (Art. 1.4.1.1). Biological tests or vaccinations should be carried out in accordance with the TAHC and the Terrestrial Manual (which provides a number of specific standards for these). Similarly, authorisation for meat or products of animal origin intended for human consumption should only be granted if the products are fit for human consumption and are accompanied by an International Veterinary Certificate.

ISPM 7 sets out an export certification system to produce valid and credible phytosanitary certificates.[184] This includes provision that the NPPO should have sole authority for the issuance and control of phytosanitary certificates, that staff with appropriate expertise should be available and that the model certificates should be used.[185] The Codex Principles of Import and Export Inspection and Certification also provide that countries which certify the export of food should take steps to ensure confidence in official inspection systems.[186]

1.4.7 Internal controls

As well as controls applicable at points of entry, internal measures are also important in maintaining levels of health and protection and for gathering data which can form the basis of risk analysis and the adoption of sanitary or

---

[184] ISPM No. 7: Export Certification System, 1997.
[185] See also IPPC 1997 Art. V
[186] Section 3.19

phytosanitary measures. Also, measures imposed internally may provide the basis for compliance with export controls and ensure that there is continuation in the application of measures applied at the point of entry.

One type of measure, related as much to import controls as internal controls, is the establishment and maintenance of Pest Free Areas (PFAs) (as defined under the IPPC) or their equivalents (zones or compartments under the TAHC, Art. 1.3.5). The TAHC provides that, given the difficulty of establishing and maintaining disease free status for an entire country, there may be benefits for member countries in establishing and maintaining a sub-population with a different animal health status within national boundaries. The TAHC provides principles and procedures for defining a zone or compartment. ISPM 1 (Principle 13) provides that countries shall recognise the status of areas in which a specific pest does not occur.[187] ISPM 4 sets out the requirements for the establishment of PFAs.[188] The establishment and use of PFAs is therefore an important Biosecurity mechanism within the context of international trade since they provide an opportunity for export without the need for the application of additional measures (when certain conditions are met). The absence of the specific pest must be officially maintained (ISPM 4, Art 1.2.1). This again is consistent with the requirements for non-discrimination in international trade. ISPM 4 provides that phytosanitary measures can be used to maintain PFAs; for example (i) regulatory action such as adding pests to lists of quarantine pests, specification of import requirements, and restricting the movement of certain products with the country, (ii) routine monitoring and (iii) extension advice to producers.[189] Similar principles will apply to the maintenance of disease free zones or compartments.

Surveillance is another important internal measure for plant and animal health. The TAHC notes that information collected through surveillance is essential to support the risk analysis process and to provide a clear rationale for the

---

[187] ISPM No. 1: Principles of plant quarantine as related to international trade, 1995.
[188] ISPM No. 4: Requirements for the establishment of Pest Free Areas, 1996.
[189] See ISPM No. 4, ibid., Art. 1.2.2

application of sanitary measures.[190] These aims are also identified, with respect to plant health, in ISPM 20. The TAHC sets out specific surveillance methods and provides that surveillance can be based on (i) structured population surveys: sampling at point of slaughter, or random surveys or (ii) structured non-random activities such as reporting and notification requirements, ante-mortem and post-mortem inspections, and field observations.[191] The IPPC 1997 requires Contracting Parties to conduct surveillance for pests and ISPM 6 describes the components of survey and monitoring systems.[192]

The use of systems of registration and licensing, and of inspection and testing, are also important internal measures. In the case of pesticides, control over the conditions of sale and use may be important not only in achieving safe and rational use in accordance with domestic Biosecurity objectives, but also in ensuring that end-products conform with the MRLs set by Codex and/or those required by importing countries, since importing countries may, in accordance with the SPS Agreement, impose more stringent controls than those provided in international standards, where these are based on risk analysis. The Codex Guidelines for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems establish that legislation should provide authority to carry out controls at all stages of production, manufacture, importation, processing, storage, transportation, distribution and trade and provides that such legislation may also make provision for the registration or listing or certified processing plants, the establishment or approval, registration or licensing of traders or approval of equipment design.[193] Further, those guidelines provide that countries should

---

[190] Appendix 3.8.1
[191] See TAHC Annex 3.8.1
[192] ISPM No. 6: Guidelines for surveillance, 1997.
[193] Sections 6. 20–21

require the use of a Hazard Analysis and Critical Control Points (HACCP) approach by food establishments.[194]

[194] Section 6.25. See *Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application*, Annex to the Recommended International Code of Practice General Principles of Food Hygiene

1.5 IMPLEMENTING BIOSECURITY FRAMEWORKS

1.5.1 National implementation of Biosecurity frameworks: international and national considerations

The challenge facing states is to implement effective Biosecurity frameworks at the national level, which allow them to meet their international trade and environment obligations as well as providing an effective system for regulating and managing relevant risks. To be successful Biosecurity frameworks should effectively and efficiently manage risks to human, animal and plant health and life and protect the environment. They should also be consistent with the economic development needs of a state and facilitate increased access to external markets. To achieve this, Biosecurity measures, including international obligations and standards, must be properly implemented. Without proper implementation of these measures governments can appear to be simply 'keeping up appearances' in terms of their international obligations while in fact not actually meeting the requirements in practical terms. Implementation in this context means, therefore, that an actual framework for the regulation of these national and international requirements and objectives should be in place at the national level. This means that as well as being signatories to international agreements, states should have an administrative and regulatory framework in place which allows for the regulation, management and enforcement of Biosecurity, so that these recognised requirements and objectives have a tangible impact at the national level.

It is important that, particularly in the case of the WTO Agreements, states must comply with their obligations and that a failure to do so ultimately may give rise to a dispute between Members. In the case of the WTO Agreements this could have serious financial implications. The implementation of standards, discussed in section 1.4, is also a general requirement for Member states of the relevant bodies. Implementation of international obligations and relevant standards and guidelines is therefore important to ensure that national Biosecurity frameworks are based on accepted principles and will therefore

enable access to international markets as well as achieving domestic Biosecurity objectives.

In this respect, states attempting to implement international standards and obligations into national regulatory frameworks may be hampered by the difficulties associated with the overlapping or conflicting requirements described in section 1.3. In particular, confusion may exist concerning the types of decision or measure that may be legitimately adopted within national frameworks or the extent to which conflicting requirements or obligations should be adopted. This in turn can lead to gaps or overlaps in national regulatory frameworks.[195]

Apart from these conflicts, implementing international agreements may be difficult for states because of the associated regulatory burden. The sheer number of requirements places a burden on implementing states.[196] This burden consists of the numerous practical requirements that accompany implementation of international obligations and national requirements: reporting requirements, technological capacity, monitoring requirements and infrastructural capacity to support these. In turn, these place a further burden on the state in terms of administrative and financial resources. For example, in implementing national food safety measures, WTO Members must take into account the need for these measures to be based on risk-analysis. In order to comply, WTO Members may undertake their own risk analysis, for which there will be certain technological and infrastructural needs. Alternatively, they may adopt international standards. In either case there may be a need to adopt import, export and internal measures which in turn will require further resources to enable administration and enforcement. The need to address the

---

[195] FAO, Rome 2001, op cit.

[196] Toepfer, Klaus, 'Implementing Multilateral Environmental Agreements at the National Level: The Search for Synergies and Complementaries', in National Councils For Sustainable Development, *NCSD Report 2001: Integrating Global Environmental Conventions At National & Local Levels*, The Councils 2002; FAO, Rome 2001, ibid; CIEL, Backgrounder on the Johannesburg Summit 2002: Enhancing Compliance and Strengthening Enforcement of Multilateral Environmental Agreements (MEAs) at <www.ciel.org/Tae/Johannesburg_Call_Back2.html> (03/08/2006)

implementation burden associated with MEAs generally has been recognised by the then Executive Director of UNEP, Klaus Toepfer: "*At the national level, the concerns are for reduction of government's burden of reporting under different MEAs; assisting governments in establishing priorities and allocating resources... supporting governments in co-ordinating preparations; monitoring to reinforce decisions taken under various MEAs and intergovernmental processes*"[197].

One of the most commonly discussed approaches for addressing both the conflict between international agreements and the implementation burden is harmonisation. The FAO has identified the need for a more coherent framework with respect to Biosecurity and has commented that the international legal framework is "*somewhat disjointed*" and that there is a need for "*a coordinated, though not necessarily unified, approach to Biosecurity, drawing on the common components. In particular, there is a need to critically examine areas of potential overlap and perhaps areas of potential conflict, such as the interrelationship between sanitary and phytosanitary measures on the one hand, and the control of invasive alien species, biological diversity and the control of GMOs on the other*"[198].

The FAO also observed that a common approach will allow for a more integrated strategy to basic Biosecurity issues while still providing for sectorial application. The international harmonisation of regulatory Biosecurity measures, including the analysis of gaps and potential overlaps within and across international agreements, the FAO notes, "*will provide the basic legal framework for a common approach to Biosecurity*"[199]. The need for harmonisation is also recognised in the more general trade and environment field as discussed by Stilwell and Tarasofsky[200] and by Toepfer who notes that

---

[197] Toepfer, 2002, op cit., p.6.
[198] FAO, Rome, 2001, op cit.
[199] FAO, Rome, 2001, ibid.
[200] Stilwell and Tarasofsky, 2001, op cit.

the international co-ordination process can aid the "*implementation of the conventions at the national level*".[201]

Achieving successful theoretical implementation of international obligations, requirements or standards is an important step in realising the goals of those obligations. However, implementation alone will not guarantee that international or national requirements and objectives are in fact met or that any effect will be realised by implementing countries. The INECE comments that "*developing legal requirements is the first step...the second step is compliance...compliance occurs when requirements are met and desired changes are achieved*"[202]. The existence of enforcement mechanisms in international agreements, such as the dispute settlement procedure of the WTO, referred to in section 1.3, facilitates compliance and provides procedures to be applied in the event of a grievance between Member states. However, the existence of effective (operational) national frameworks and enforcement procedures is necessary to ensure that the objectives of the national framework are in fact realised.

With respect to harmonisation of national Biosecurity measures, the FAO has observed that some of the difficulties observed at the international level may be reflected at the national level, in particular that

- Controls and national authority for Biosecurity matters tends to be scattered over a variety of Ministries
- In developing countries, authorities tend to be organised along sectorial lines, although the need for a co-ordinated approach may be particularly important, for example for small island countries with particularly vulnerable ecosystems.[203]

---

[201] Toepfer, 2002, op cit., p.7.
[202] USEPA, *Principles of Environmental Enforcement*, USEPA, (with Poland's Environment Ministry and Dutch Ministry), The International Network for Environmental Compliance and Enforcement, 1992. Available at <http://www.inece.org/enforcementprinciples.html> (03/08/2006)
[203] FAO, Rome, 2001, op cit.

The principles of harmonisation of Biosecurity frameworks are therefore applicable at the national level and this approach is recommended by the FAO.[204] As suggested by the FAO (above), harmonisation does not necessarily involve the unification of Biosecurity measures across different states, rather a holistic or co-ordinated approach is encouraged. Such a co-ordinated approach is provided for, to some extent, by the use of international standards and guidelines published by the IPPC, OIE and Codex. At the national level, this can be based, for example, on co-ordination of legislative measures for food safety, plant health, and animal health. Harmonisation of national measures, it has been argued, would enable improved implementation and enforcement through the elimination of overlapping responsibilities and regulatory gaps. This may also bring the benefits of increased efficiency and improved use of resources.[205]

Enforcement of measures at the national level is also important. As has been seen, the operation of import, export and internal controls for Biosecurity assumes (and in fact the international texts require) that there will be mechanisms and procedures in place for enforcement action to be taken in the event of non-compliance and to facilitate longer-term compliance. National enforcement is also important in ensuring that international objectives, such as those provided in MEAs, are achieved. Scott Hajost and Quinlan Sheau recognise that "*international law... does not have the same hierarchical structure as do national legal systems. National legal systems have legislative bodies, courts and government officials that create, define and enforce legal obligations*"[206]. It can be seen that the matter of national enforcement is important since international enforcement mechanisms cannot operate on the

---

[204] FAO, 2001, ibid.; FAO, Rome, 2003, op cit.

[205] This is addressed in the project 'Harmonisation of African Phytosanitary Legislation' which sought to strengthen the ability of national African governments to comply with the SPS Agreement and thus participate in international trade. The project made recommendations for harmonisation of legislation based on analysis of national phytosanitary provisions. See UA/ CPI – NRI, Harmonisation of African Phytosanitary Legislation, available at <http://www.au-appo.org/en/article.php3?id_article=11> (03/08/2006)

[206] Hajost, Scott, A. and Quinlan, J, Shea III., 'An overview of Enforcement and Compliance Mechanisms in International Environmental Agreements', The International Network for

same basis as national mechanisms. This applies perhaps more to MEAs than to the enforcement of WTO Agreements since the introduction of the DSB and AB have provided a more formal enforcement mechanism than applies to most other relevant agreements.

The objectives of international agreements essentially hinge on the condition that Member states will implement the obligations at the national level. For example, the goal of sustainable use of biological resources, as set out in the CBD, cannot be realised unless each Contracting Party carries out its obligations at the national level and this will include the ability to enforce those obligations. This position is recognised by Marcia Mulkey and Keith Chanon, who comment that "*upon completion of an international agreement, each country must then translate the treaty obligations into national law. Governments must be empowered to implement laws and regulations to promote compliance*"[207]. However, a state is free to implement and enforce these obligations at the national level in the most appropriate way for its own jurisdiction.

Some similar themes regarding national enforcement are recognised by INECE and by Mulkey and Chanon, primarily that there must be suitable legal authorities so that there is an ability to introduce necessary measures and so that it will be clear who is responsible for, and who is subject to, those measures. Sufficient information and technical expertise should be available. Finally, the **regulated community** should be clearly identifiable and should support and understand the need for the measures. It can be seen from these elements that a number of factors will affect the approach to enforcement and the suitability of enforcement mechanisms. For example, what the regulated community in one state will support may not be supported in another state. Likewise different

---

Environmental Compliance and Enforcement, <http://www.inece.org/1stvol1/hajost.htm> (03/08/2006)

[207] Mulkey, Marcia E and Chanon, Keith E, 'National Compliance and Enforcement of International Environmental Treaties', conference paper presented at the *Sixth International Conference on Environmental Compliance and Enforcement*, INECE, San Jose, Costa Rice, April 15–19, 2002. See <http://www.inece.org/conf/proceedings2/19-Nationalompliance.pdf>

sections of the regulated community may disagree about what type of enforcement is acceptable and whether there is a need for, in this case, Biosecurity measures. States must therefore attempt to adopt a framework that meets these requirements in order to realise the broader Biosecurity objectives.

It can be seen that enforcement provides a further challenge to the implementation of effective Biosecurity frameworks. These frameworks will seek to meet international obligations and in doing so a state must ensure that there is actual enforcement of Biosecurity measures rather than their simple existence. Some commentators argue that there must be improved enforcement mechanisms within and between the international agreements themselves, as seen above. However, ultimately states will be responsible for meeting their international obligations and must therefore ensure that there is a sufficient means to enforce the measures on a national basis. These issues are not only relevant for international agreements but for Biosecurity frameworks generally. In implementing such frameworks governments may wish to introduce a number of measures to ensure national compliance with the framework and must therefore ensure that there is some effective means of enforcement at that level in order to achieve the aims of the framework.

1.5.2 Issues for Developing Countries

While the problems identified above are common to all states attempting to implement effective Biosecurity frameworks, they may often be felt more severely by governments of developing countries whose status gives rise to additional problems.

In terms of the trade-environment issues discussed above, and the need for developing countries to gain and to maintain access to export markets, problems may again be greater for developing countries. The FAO recognises four particular issues of concern for developing countries:

- "*The costs of compliance; particularly with the standards applied in export markets is an issue of concern for developing countries because the compliance costs with environmental measures may be higher for the*

developing countries than for developed countries, placing them at a competitive disadvantage

- *'Product-unrelated' production and processing methods may generate negative production externalities without affecting the quality or safety of the final product...*
- *'Eco-labelling'... the important issues for developing countries are whether such systems incorporate unrelated PPM... if the eco-label requirements are not in accordance with WTO principles, they may function as discriminating trade measures*
- *Harmonisation as implemented by the WTO encourages governments to adopt national standards to those set by designated international experts. Some observers regard a country's environmental regulatory system as an integral part of its comparative advantage and thus consider harmonization undesirable, particularly when there are no transboundary environmental effects associated with the issue being regulated. Developing countries are concerned that harmonisation may adversely affect their competitiveness in global markets*"[208].

These concerns highlight particular problems that developing countries may face when attempting to implement necessary measures or to take advantage of the international trading system.

As well as problems of compliance with international principles and obligations some specific issues illustrate that the need to maintain effective national Biosecurity frameworks may be of particular importance for developing countries. It has been seen above that the problem of invasive alien species is one of the most important components of Biosecurity, affecting human, animal and plant health and life, the environment and the economy. The need to regulate and to manage the risks related to the introduction of invasive alien species may be particularly important for developing countries because of the potential impact on fragile ecosystems and economies. The CBD notes some of the problems arising from invasive alien species: "*Alien Water Weeds... are a global problem; African nations alone spend an estimated US $60 million annually on their control. International trade has introduced the Asian Tiger Mosquito— which carries dengue fever— to the Americas and Africa, and has spread life-threatening [strains of] bacteria Escherichia coli in meat*

[208] FAO, Agricultural Trade Fact Sheet: Trade, Environment and Sustainable Development, <http://www.fao.org/docrep/003/X6730E/X6730E01.HTM> (03/08/2006).

exports"[209]. It can be seen that states affected by limited resources in terms of finance, technical capacity, human resources and infrastructure can be substantially adversely affected by the problems of invasive species that can have severe economic and Biosecurity related consequences.

Problems can also be acute in relation to GMOs. It has been noted that the pressure for harmonisation and the development of legal frameworks from both internal and external bodies can lead to the introduction of insufficient regulatory programs. Ruth Mackenzie and Dominic Glover note that, "*demands for speedy progress of Biotechnology research and development have led to ad hoc responses which, though may be pragmatic in the short term, may obscure the need for clear and comprehensive regulation based on a thorough appraisal of national needs, priorities and capacity*"[210]. The failure to plan effectively and to regulate biotechnology measures may have serious effects on human, animal and plant health and life and the environment. However, developing countries face a number of pressures in this area, including limited financial and technical capacity, which may make such planning difficult.

Developing countries also face the problems of implementation and enforcement described above. It has been seen that there may be a heavy implementation burden for countries attempting to implement Biosecurity frameworks, particularly where this involves the implementation of international requirements or standards. For countries with limited resources this may be particularly difficult. For example, some developing countries may not have the resources to maintain laboratories to carry out testing and analyses or may lack the infrastructure to maintain border controls and import measures.[211] Commenting on the implementation of MEAs, Toepfer notes that

---

[209] CBD, *Alien Species; Introduction*, op cit.

[210] Mackenzie, Ruth, with Glover, Dominic, 'Harmonisation, diversity and uncertainty in International Biosafety regulation'. *Democratising Biotechnology: Genetically Modified Crops in Developing Countries Briefing Series*, Briefing 6, Brighton: UK, Institute of Development Studies (IDS), 2003. p.1.

[211] Financial and technical capacity may be limited and external issues such as corruption and political will can increase the problems with implementation. See Faure, Michael G,

"*implementation of MEAs place a significant burden on countries, especially developing countries and countries with economies in transition both in terms of planning, implementation and reporting. These requirements amount to a formidable burden for many countries, which are already suffering from severe human and institutional capacity restraints*"[212]. This sentiment is echoed by Mackenzie and Glover, specifically in relation to the Biosafety Protocol.[213] Clearly the burden on developing countries is great and may exceed their capacity. The need to prioritise may mean that some areas are inadequately regulated and may leave them in breach of their international obligations as well as potentially exposing human, animal and plant life and the environment to adverse effects.

As has been seen, the FAO has recognised that Biosecurity in developing countries may be organised along sectorial lines and this may not provide the best available level of regulation or use of resources. Because, as discussed above, sectorial regulation may result in overlaps and gaps in regulation and does not provide for an efficient use of resources it is desirable to co-ordinate Biosecurity frameworks so that they are more effective and more efficient. With respect to this, the FAO has suggested that there may be a particular need for technical assistance to developing countries in adopting co-ordinated approaches to Biosecurity and for the strengthening of relevant national and regional institutions.[214] The need for technical assistance and capacity building is also recognised by the OIE, the IPPC and Codex. At a meeting of the Committee on Agriculture in 2003, the FAO reiterated this sentiment stating that "*closer cooperation among institutions responsible for implementing Biosecurity and the rationalisation of infrastructures, where appropriate, will benefit, in particular, developing countries and countries with economies in transition*"[215]. At this meeting the FAO recognised the "*central importance*" of

---

Enforcement issues for Environmental Legislation in Developing Countries, UNU/INTECH Working Paper No. 19, March 1995.

[212] Toepfer, Klaus, 2002, op cit., p.11

[213] Mackenzie and Glover, 2003, op cit.

[214] FAO, Rome, 2001, op cit.

[215] FAO, Rome, 2003, op cit.

capacity building to assist developing countries in establishing and maintaining effective Biosecurity frameworks.

The enforcement and implementation of international agreements and, in turn, Biosecurity frameworks, poses problems for developing countries. The requirements of these agreements, though sometimes supported by provisions intended to support developing countries in implementing the agreement, may be difficult to achieve or may be unachievable because they do not take into account the actual conditions and capacity of the implementing country.[216] Despite the existence of provisions under the GATT and in relevant MEAs designed to improve the position of developing countries under those agreements, it has frequently been argued that there is often a wide discrepancy between the potential benefits of the agreements and the actual benefits achieved at the national level.[217] The need to consider local conditions for the purposes of implementing environmental legislation is discussed by Michael Faure, who notes that both formal and informal legal procedures as well as social and political attitudes may operate differently in developing countries than in 'Western' countries and this will lead to specific considerations for the implementing country[218]. The international agreements often do not make sufficient provision for the existence of different regulatory and legislative systems in developing countries or of different environmental, social, economic and political climates in the implementing countries and the potential to implement these measures at the national level is therefore restricted further.

---

[216] For a summary of GATT/WTO provisions aimed at developing countries and LDCs and discussion of the status of those provisions see Olivares, Gustavo, 'The case for giving effectiveness to GATT/WTO rules on developing countries and LDCs', *Journal of World Trade*, vol. 35, no. 3, 2001, pp.545–551.

[217] For discussion of the theory and practice of differential obligations under the CBD see Iles, Alastair, 'Rethinking differential obligations: equity under the Biodiversity Convention', *Leiden Journal of International Law*, 16, 2003, pp.217–251. In relation to food safety see Athukorala, Prema-Chandra & Jayasuriya, Sisira, 'Food safety issues, trade and WTO rules: a developing country perspective', *World Economy*, vol. 26, no. 9, 2003, pp.1395–1416.

[218] Faure, 1995, op cit.

1.6 THE IDENTIFIED NEED FOR WORK

This review has sought to illustrate the main influences and issues surrounding the development of Biosecurity frameworks. The key issues can be summarised as:

- In attempting to regulate successfully Biosecurity states should seek to be able to achieve a suitable level of protection for human, animal and plant health and life, to protect the environment generally and to access the benefits of international markets through the multilateral trading system.

- The majority of states are signatories to international trade agreements and Multilateral Environmental Agreements which contain obligations that affect the choices that the state can make regarding Biosecurity.

- Apart from these obligations there are a number of complex areas which provide uncertainty for states as to the extent to which certain Biosecurity decisions will be compatible with international obligations.

- In addition, international bodies with responsibility for plant health, animal health and food safety develop internationally accepted standards for the implementation and use of Biosecurity measures by states.

- States may have difficulties when attempting to implement Biosecurity frameworks. These problems arise, on the one hand, from a lack of clarity in relation to some trade-environment issues and the conflict between some environment and trade measures and, on the other hand, from the practical issues surrounding implementation including technical capacity, sufficiency of infrastructure and resource issues.

- Once a system is in place that achieves both a suitable level of protection for Biosecurity and meets international obligations then that system must be enforced at the national level in order to ensure compliance. States may again have some problems concerning resources and infrastructure. Suitable

enforcement mechanisms must be put into place and there will be a number of factors affecting the approach to enforcement.

Much of the literature referred to in the preceding sections deals with specific trade-environment issues. Some of the identified need for work in that field, discussed in the rest of this section, also reflects gaps in the specific field of Biosecurity, since it is against the backdrop of that international legal framework, and the ensuing implementation issues, that Biosecurity regulation takes place. This section, therefore, evaluates the identified need for research in the field of trade and environment in relation to Biosecurity. The FAO has specifically considered the need for research in Biosecurity and this will also be considered below. Finally, the limitations of the research needs, identified so far as applicable to Biosecurity, are discussed.

It is recognised that it is of great importance to prevent conflict between international agreements and to clarify the measures that states can take in order to fulfil their international obligations. Much of the debate about how to address the problems arising from competing or overlapping obligations has focused on the need for action at the international level, specifically for the co-ordination and clarification of international agreements.

In an Earth Council–NCSD report, Toepfer provides one of the most important and relevant papers for the current discussion in which he examines the issue of implementing MEAs at the national level.[219] The paper identifies the need for policy coherence through enhanced co-ordination of MEAs (and other relevant intergovernmental organisations). This is a sentiment which was stated in 1998 in relation to the CBD.[220] In that meeting it was noted that UNEP could contribute to the enhancement of co-operation and synergy among the relevant conventions and in harmonising the work programmes pursuant to the Convention. Similarly, the CBD Secretariat themselves note the need for a

[219] Toepfer, 2002, op cit.

coherent approach to implementation noting that some of the major challenges to implementing the CBD are "*improving policies, legislation, guidelines and fiscal measures for regulating the use of Biodiversity*"[221]. There is a clear need then for a coherent approach to trade and environment issues and agreements. It is thought that addressing the areas of conflict or of overlap will reduce the element of uncertainty for states attempting to implement the agreements and thus improve compliance.

However, progress at the international level is difficult. The process is very slow and hindered by the extensive political considerations that accompany the drafting and redrafting of international provisions.[222] As has been seen above, some of the problems arising from the conflict and uncertainty between trade and environment measures have been evolving for a number of years and to date there has been little or no progress in resolving them. In the meantime, states must still try to implement acceptable and effective Biosecurity frameworks that also allow them to meet their international obligations. As well as the level of uncertainty arising from these obligations states must also try to overcome the 'implementation burden' resulting from the requirements for implementing frameworks.

The need to address the implementation burden associated with international agreements, as identified by Toepfer, has been seen above at page 67. Toepfer recognises the need to assist national governments in meeting their obligations and implies that this will be achieved through increased co-ordination at the international level. This would reduce significantly the implementation burden on states since it would remove some of the confusion as to which measures are acceptable and also remove or reduce areas of overlapping competence.

---

[220] Töpfer, K,. Statement by Mr. Klaus Töpfer, Executive Director, United Nations Environment Programme, to the Convention on Biological Diversity, Bratislave, Slovakia, 5 May 1998.

[221] CBD, 'Sustaining Life on Earth: How the Convention on Biological Diversity promotes nature and human well-being', April 2000. <http://www.biodiv.org/doc/publications/guide.asp> (03/08/2006)

[222] The on-going battle in the WTO surrounding the European Common Agricultural Policy (CAP) provides one example of the nature of these kinds of negotiations.

However, as mentioned above, achieving international consensus is a difficult and slow process. Another important point is that increased co-ordination *per se* may not substantially lessen a state's burden because such measures will not take into account the actual problems regarding implementation and enforcement that arise at the national level, nor will it establish the most suitable framework for different states.

Addressing the practical problems of the implementation of Biosecurity frameworks and adherence to international obligations at the national level could be useful since this could provide states with a practical basis for improving these frameworks and could also inform the international co-ordination process by identifying priority areas. Toepfer notes that "*the most significant efforts [for coordination] will emerge from the bottom-up rather than the top-down approach*"[223]. This further illustrates that there is a real need to identify the most effective and appropriate approaches to implementing national frameworks in order to meet Biosecurity objectives including international compliance. The confusion and overlapping of international agreements illustrates the difficulties in imposing a primarily top-down approach. In order to address those difficulties, the actual problems and needs of individual states should be considered. The co-ordination of international agreements is not, on its own, enough to achieve sufficient implementation and compliance. There will still be issues arising due to the existing practicalities of implementation and the conditions in the individual states.

It is necessary to understand the basic problems with implementation at the national level, not just those arising from conflicting obligations, but also human, resource and infrastructure factors that prevent successful implementation and enforcement. With respect to MEAs, Toepfer acknowledges the need to overcome these institutional 'hurdles' and also the need to consult stakeholders, at the international level, but the real issue is the implementation of these MEAs and trade agreements at the national level: "*The*

[223]Toepfer, 2002, op cit., p.7.

[UNEP] vision calls for bringing together all the major actors to discuss, debate and agree on the components that will support the harmonized and coordinated implementation of the conventions at the national level. The center piece of coordination will be the implementation of the conventions at the national level"[224]. The need to co-ordinate international agreements and thus to ease the implementation burden and to improve compliance for countries is apparent. By identifying problems at the national level the co-ordination process at the international level could, it is submitted, be made easier and more efficient.

Toepfer outlines some of the priority areas for work for the purposes of achieving coherence and co-ordination including avoiding duplication of effort, promoting synergy, identifying opportunities for collaboration and identifying gaps in research. Toepfer also notes that the UNEP guidelines on enforcement and compliance "*need to be complemented by coordination between the MEAs through a number of measures*"[225]. Though the need for a 'bottom-up' approach has been expressly recognised by Toepfer these suggestions emphasise a primarily 'top-down' approach in terms of national implementation. Toepfer recognises that unless international requirements are fully implemented at the national level they can constitute "*just another set of plans*"[226]. However, his paper does not address the root problem of how states can achieve successful national implementation and compliance because his argument focuses on how the conventions can help states realise a common approach rather than how they can effectively implement and benefit from international agreements through the use of national measures. Toepfer does, however, go on to consider national implementation of international obligations and acknowledges the need for national harmonisation stating that "*new efforts are needed to stimulate collaboration, cooperation and greater harmonization between the various ministries in order to catalyse integrated approaches to implementation at the*

[224] Toepfer, 2002, ibid.,p.7
[225] Toepfer 2002, ibid., p.11.
[226] Toepfer, 2002, ibid., p.11.

national level"[227]. This does recognise the need to address some of the barriers to implementation. Harmonisation could be a way to decrease the implementation burden but in order for this to happen it will be necessary to discover what the problem areas for implementation at the national level are and what areas of overlap or regulatory gaps exist.

In order to facilitate the effective review of implementation issues related to international agreements and to assist states in achieving successful implementation of Biosecurity frameworks, including meeting their international obligations, the actual problems at ground level facing implementing states should be addressed. Situations causing problems with implementation and barriers to implementation and compliance should be identified and could then be addressed in an attempt to discover an effective approach to implementing Biosecurity frameworks.

Resolving trade-environment issues, through the removal of conflict and uncertainty is necessary so that implementing countries can be clear about whether national Biosecurity measures will be consistent with international obligations. The central issue is how countries can achieve this. One way to improve the co-ordination process might be to establish exactly what effect, if any, the conflicts arising from international agreements have at the national level. This could facilitate more effective suggestions as to how to tackle problems. Most of these issues are currently addressed at the international level, for example by the GATT Dispute Settlement Process, but an investigation into the actual problems arising could facilitate research into ways to co-ordinate these issues and prevent further breaches and international disputes.

Stilwell and Tarasofsky, for the WWF, also discuss the need for coherence in this area.[228] This paper again focuses on the main trade-environment issues at the international level. The paper considers the potential for synergies between MEAs and the WTO, including increasing formal contact between Secretariat

---

[227] Toepfer, 2002, ibid., p.11.

staff and increasing the flow of information. Again, this is a focus on improving enforcement and compliance by making changes at the international level (and on preventing disputes from arising). The paper makes a number of recommendations, the majority of which focus on work at the international level and not on how states can, in fact, meet their obligations within the context of suitable national frameworks. However, there are some national recommendations and, as was recognised by Toepfer, these recognise the need for a "*strong public participation*" component:

- "*Create new mechanisms and strengthen existing mechanisms that include a strong public participation component to facilitate more systematic cooperation and coordination between national trade and environment officials; and*
- *Develop an agenda for co-operation that addresses the both practical and legal linkages between MEAs and the WTO, and both areas of synergy and potential conflict*"[229].

These recommendations also recognise the need for harmonisation at the national level in order to overcome the obstacles posed by areas of conflict, again, as recognised by Toepfer, above. The recommendations are thus not entirely top-down in their approach. The meeting of the CTE in June 2001 also acknowledged the need for "*enhanced policy coordination*" on trade and environment issues at the national level while the importance of addressing concrete, not hypothetical problems related to WTO-MEA linkages, was noted.[230]

There is a need to discuss the hypothetical problems as well as actual problems as can be seen from the issues discussed earlier. However, it is important that the actual problems that occur are identified as this can form a solid basis for improving coherence. It is argued, by the present researcher, that in order to resolve the conflicts and tensions at the international level it is necessary to look also at the causes of these problems. As well as addressing problems arising from conflicting WTO and MEA principles there is also a need to

---

[228] Stilwell and Tarasofsky, 2001, op cit.
[229] Stilwell and Tarasofsky, 2001, ibid., p.21.
[230] CTE, TE/036, op cit.

identify how these arise and are addressed at the national level. By identifying the situations in which problems with implementation arise or where countries implement a measure that is inconsistent with their international obligations then the most effective way of addressing the problems at the international level can also be identified. Further, the most suitable way for states to address their obligations and implement suitable national frameworks can also be discovered.

UNEP have issued specific guidelines on 'Compliance with and Enforcement of Multilateral Environmental Agreements'[231], a substantial number of which address issues related to developing successful MEAs rather than implementing existing agreements. However, they also address national implementation including the development of a compliance plan (guideline 19) and enforcement programmes (guideline 22). These guidelines are useful because rather than simply addressing the need for international coherence, they offer practical guidance for Contracting Parties attempting to implement existing agreements and meet their international obligations. In so doing, they highlight the need for implementation at the national level and for assisting Contracting Parties in achieving that implementation. They also recognise the importance of consulting stakeholders at all levels for the purpose of achieving compliance. What is needed to follow on from these guidelines is an investigation into the best way in which to achieve the elements suggested, for example, the best approach to the introduction of enforcement programmes.

The specific issues concerning Biosecurity have been addressed by the FAO. In its meeting on Biosecurity in Food and Agriculture in 2001 the FAO emphasised the need for co-ordination and the need to address areas of overlap in terms of national Biosecurity frameworks. At the meeting on Biosecurity in Food and Agriculture in 2003 the FAO made several recommendations concerning Biosecurity. Of particular relevance are the following:

---

[231] UNEP, Guidelines on Compliance with and Enforcement of Multilateral Environmental Agreements. 2001. Available at <http://www.unep.org/DEC/docs/UNEP.Guidelines.on.Compliance.MEA.pdf>

> *"(i) Countries should determine the potential for synergies and harmonization within their national and sub-national regulatory frameworks that would result from a holistic and coordinated approach to Biosecurity...*
>
> *(vii) FAO, in collaboration with relevant international and regional organizations should provide guidance and develop guidelines to assist countries to develop and implement national Biosecurity frameworks in harmony with their international obligations.*
>
> *(viii) FAO, in collaboration with other relevant international and regional organizations should consider undertaking further analysis to better understand and advance Biosecurity including:*
> - *analysis of differences, similarities, duplications and gaps across the various sectors of Biosecurity;*
> - *the implications for developing countries and countries with economies in transition of Biosecurity standards, procedures and technical regulations; and*
> - *measures required to establish coherent and mutually supportive approaches in relation to food safety, animal health and life, plant health and life and the environment"*[232].

It can be seen then that whilst the debate on resolving issues in the trade-environment field has focused on the need for co-ordination at the international level, it has been recognised that Biosecurity issues must be addressed on a national basis. Both approaches recognise the need to identify gaps and overlaps and to improve coherence and harmonisation and remove the element of doubt concerning legislative action. The two approaches are, therefore, complementary. Work in one field may contribute to work in another and in fact work in either field may involve addressing some of the issues in the other. Addressing national approaches to the implementation of Biosecurity frameworks will involve identifying problems with the implementation of international agreements and improving coherence between international agreements will necessarily involve identifying the main problems with implementation at the national level.

Much of the work reviewed in this section has focused on the need for research in relation to the identified difficulties in the field of trade and the environment

---

[232] FAO, Rome, 2003, op cit.

and the implementation of corresponding international obligations. This research is often relevant to Biosecurity since addressing those issues is likely to have a positive impact on the implementation of Biosecurity frameworks. However, the difficulty in making progress at the international level has been identified. The work in this field has also focused on the need for individual states to implement their international obligations. In the context of Biosecurity these international obligations are important but there are further matters to be taken into account when implementing Biosecurity frameworks, specifically the attainment of national Biosecurity objectives. The identified need for research is generally top-down in approach. For the purposes of the successful regulation of Biosecurity and the implementation of national Biosecurity frameworks, there is a need to move away from this top-down, international focus and to consider how, if at all, these problems are affecting national Biosecurity regulation and what other issues states face in attempting to implement national Biosecurity frameworks. The need for work specifically in relation to Biosecurity, as identified by the FAO, has a national, rather than international, focus and recognises the need to investigate the actual issues facing states in implementing Biosecurity frameworks.

Chapter 2: Background to the study

This chapter addresses the design of, and background to, the study. In the first part of the chapter the overall research problem is identified. In the second part, some important perspectives, relevant to the research problem, are discussed. Firstly, the theoretical perspectives arising from the law in development literature are examined. Secondly, the adopted methodological approach, that of 'grounded theory', is discussed. In the third and final part of the chapter, the background to the Biosecurity frameworks that were to be investigated is provided. This includes presentation of the aims and objectives of each of the two phases of study, the first being an investigation of Belize's pesticides control framework, and the second being an investigation of the Belize agricultural health framework. Together, these two phases of investigation provided a case study of Belize's Biosecurity frameworks for the purpose of addressing the overall research problem.

2.1 THE OVERALL RESEARCH PROBLEM

As the review of current issues in the field of Biosecurity law has demonstrated, although substantial debate and research has focused on the need to co-ordinate international agreements there has been little work done in relation to **national** Biosecurity frameworks. Research into national Biosecurity frameworks is an area which has been identified by some of the most relevant international institutions, including UNEP and the FAO, as deserving investigation and as having the potential to provide an important contribution to the field of Biosecurity. Such research would include, the success or failure of states to implement Biosecurity frameworks; the effectiveness of these frameworks in terms of achieving desired national Biosecurity objectives; the success or failure of states to meet international obligations within these Biosecurity frameworks; and the actual problems that states face in attempting successfully to implement and enforce national Biosecurity frameworks.

The approach of much of the research relevant to Biosecurity, including debates in the field of trade and environment, has focused on analysing international agreements in order to identify and, to some extent, address actual and potential problems related to the compatibility of international agreements. Little Biosecurity-specific research has been carried out and much of the work has focused on the identification of external factors, such as international obligations,

and the need to incorporate these into national Biosecurity frameworks. Importantly, however, the need to identify issues relevant to the successful implementation and enforcement of Biosecurity frameworks at the national level and to investigate national provisions and problems related to Biosecurity has been recognised, by the FAO in particular (see Chapter 1) but research in this field has not yet been forthcoming.

It can be seen that the approach to Biosecurity research (and to the wider trade and environment considerations) has been primarily '**top-down**', with an emphasis on beginning at the international level and discussing issues in relation to pre-conceived ideas and objectives. The focus has been on identifying and addressing problems at the international level with a view to improving national implementation through improved coherence and clarity of international agreements. As seen in Chapter 1, however, there is a need for research which focuses on the investigation of issues from the '**bottom-up**'. With respect to the investigation of legal and regulatory frameworks it is submitted that such investigation must involve research into the actual operation of these frameworks rather than confining studies to the relevant statutory provisions and any case law.

The present research intended, therefore, to contribute to the field by investigating the implementation of national Biosecurity frameworks and by taking a primarily 'bottom-up' approach. The aim of adopting this approach was to enable the effective investigation of national Biosecurity frameworks by allowing for the identification of actual problems, and successes, within given frameworks, and the circumstances in which these arise. In turn, this information could be used to consider suitable approaches to implementing national Biosecurity frameworks. Such an investigation would make a number of contributions to the field possible. Identifying problems that occur at the national level, within a given framework or state, could provide important insights regarding the implementation or adoption of national Biosecurity frameworks more generally. In identifying such problems the reasons that they are occurring could be discovered. Gaining such information would provide an increased opportunity for those issues to be more effectively

addressed in the future. This approach would also allow for recognition of the affects of national implementation of international agreements. These insights could contribute to a greater understanding of, and an improvement in, the situation at the international level. It could also contribute to research into the implementation and co-ordination of international agreements by enabling consideration of whether the problems identified at the national level are the same as those caused by the identified conflict between international agreements, or whether in fact implementing states are experiencing different problems

Research into national Biosecurity frameworks can help states to identify approaches that might or might not be suitable and effective within their particular situation and therefore can assist with the design and implementation of successful and effective Biosecurity frameworks. In order to contribute to research in this area, the present thesis considers the question; 'How can developing countries achieve effective Biosecurity frameworks?' The term 'frameworks' is used to include the primary and secondary legislation that is intended to achieve the Biosecurity objectives and the implementation and enforcement procedures that will support this. The ultimate aim of the study was to identify problems and successes in given Biosecurity frameworks and to offer possible explanations as to why these might occur. This would lead to consideration of how Biosecurity frameworks might be implemented in order to avoid some of the problems identified or to achieve particular successes. By identifying particular problems and/or successes some general suggestions might be made as to how these might apply in other contexts/other states. It was also intended that this analysis would allow for the identification of particular international provisions that are not being met (or perhaps are being met successfully) and possible reasons for this. This might contribute to the continuing debate surrounding the co-ordination and amendment of international agreements.

In this way, the investigation of national implementation of Biosecurity frameworks would provide new insights into the field of Biosecurity and could contribute to improved regulation of Biosecurity and in turn the achievement of

Biosecurity objectives in individual states (focusing on developing countries). The bottom-up approach to investigation is relatively novel in regulation generally and is certainly novel in the field of Biosecurity Law.

Overall research aims

Within the context set out above, the overall research aims were:

- to investigate given national Biosecurity regulatory frameworks in developing countries with a view to identifying effective approaches to regulating Biosecurity and to consider how these might be used in other Biosecurity frameworks; *and*

- to identify problems with these Biosecurity frameworks and to consider why these problems occur and how they might be addressed in order to improve Biosecurity regulation in developing countries; *and*

- to examine the overall effectiveness of the given Biosecurity frameworks in terms of their achieving the particular Biosecurity objectives provided for in the context of national conditions.

- (Secondary aim) to consider whether the findings can provide any insights into the problems caused by the conflict of international agreements and, specifically, what the particular problems appear to be, in the context of the given national Biosecurity frameworks, and how these relate to the problems that have already been identified in the existing literature and research.

2.2 THEORETICAL AND METHODOLOGICAL PERSPECTIVES

Since the focus of the present research is on the implementation of legal frameworks in developing countries and takes place in the broader context of 'sustainable development' it is important to review the traditional role and the re-evaluation of law as a tool for development. This section considers the role of law in development and how this affects approaches to current legal investigation. The section goes on to consider the development of empirical approaches to legal research, namely the pursuit of grounded theory adapted by the Southern African Women's Law movement, as divergent from traditional, 'black-letter' approaches to legal enquiry. Finally, the methodology adopted for the present research, grounded theory, will be considered in more detail.

2.2.1 Law, development and the investigation of Biosecurity law

Since this study is concerned with Biosecurity Law in developing countries the theoretical perspective for the research design drew heavily on the wealth of literature and discourse on the role of law in developing countries and its place in the context of development. The historical and current debates about the way that law can and should be used in developing countries and the extent to which it can contribute to the development of particular states is considered. This, in turn, involves some consideration of what law is and how law should be used and identified in research and in practice.

2.2.1.1 Law and Development

The Modernisation Theory of development arose from the colonial view that development, for colonised countries, could be achieved by transposing into those countries the same systems and institutions as existed in the colonising country. Development was viewed as a linear process, beginning, at one end, with 'under-development' and resulting in 'development' in the form of Western-based capitalism, at the other.[233] The **Law And Development** movement originally

---

[233] See Adelman, Sammy and Paliwala Abdul, 'Law and Development in Crisis' *in* Adelman, Sammy and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*, London: Hans Zell, 1993. pp. 3–5. See also Hettne, Björn, *Development* Theory *and the Three Worlds: Towards an*

viewed the role and nature of law in light of the Modernisation Theory. Law had an essential role to play in the development of third world countries for the purposes of nation building and economic development. The imposition of Western ideals and institutions such as the rule of law and, in the case of British colonies, the English Common Law system, would, it was thought, give rise to development and this development would result in the same 'achievements' as could be seen in the West. Law was, therefore, conceptualised as a neutral, organising force, which was inherently able to effect the realization of these development objectives. There was no real consideration of the suitability of these western legal systems for other, developing, states despite the existence of different political, economic, social and environmental conditions. The goal for developing countries was to achieve modernisation and this was measured exclusively by Western defined characteristics.[234]

Developments in the 1960s exemplified the firm belief of the role of law in achieving development. During this period a number of institutions in the U.S.A, including the U.S. Agency for International Development and the Ford Foundation[235] attempted to reform and restate the laws of countries in Africa, Asia and Latin America.[236] This movement was still guided by the notion that law had a central role to play in development and that legal professionals could in this way act as social engineers.[237] Another important aspect of this law and development work was the training of legal professionals and legal academics in the role of law in development in order to advance the reform efforts and help bridge the recognised gap between the 'law on the books' and the 'law in action'.[238]

---

international political economy of development, 2nd edition, Harlow: Longman Scientific & Technical, 1995

[234] Davis, Kevin and Trebilcock, Michael J, *What role do legal institutions play in development?*, Draft prepared for the International Monetary Fund's Conference on Second Generation Reforms, University of Toronto, November 8–9, 1999.

[235] Following work in the UK, including a project led by the School of Oriental and African Studies, London.

[236] See The World Bank, 'Reform Strategies: What Works, What hasn't?, 'Law and Development Movement', <http://www1.worldbank.org/publicsector/legal/ldmovement.htm> (03/08/2006); Ghai Yash, 'Law, Development and African Scholarship', *Modern Law Review*, vol. 50, October 1987, pp.750–777.

[237] The World Bank, *Law and Development Movement*, ibid.; Ghai, 1987, op cit.

[238] The World Bank, *Law and Development Movement*, ibid.; Ghai, 1987, op cit.; Davis and Trebilcock, 1999, op cit.

The optimism in this field of 'law and development' was, however, short-lived. The movement was criticised, perhaps most famously by David Trubek and Marc Galanter.[239] A number of reasons for the perceived failure of the movement have been identified. One of these, identified by Trubek and Galanter, was that the movement had no 'scientific basis' or theory for the effect of law on development.[240] Another argument was that the movement had focused on the formal legal system and had not incorporated customary law or other informal mechanisms for order used in many developing countries. Perhaps most significantly the idea that the U.S. legal system, in the case of the American projects, could be successfully transposed to developing countries without adaptation was criticised as ethnocentric and naïve.[241] This criticism and the loss of interest in the movement, to a certain extent, by developing countries,[242] led to its rapid decline.

Also in the 1960s, and outside the western schools of thought, the modernization theory was challenged by a group of Latin American scholars who became known as dependency theorists or *dependentistas*. These dependency theorists questioned the assumptions of the modernisation paradigm and "*argued that underdevelopment is a consequence of capitalist penetration into the Third World*"[243]. This perspective contrasted with the Western determined modernization theory. Dependency theory held that "*development in many less developed countries would inevitably be conditioned by the fact that it occurs in the context of a complex economic, political and cultural relationship with more developed countries*"[244]. In this context members of the law and development movement argued that legal institutions had a much more limited role to play than that assumed by modernization theorists, with change primarily coming from economic activities in which the law had little influence. "*Therefore, rather than*

---

[239] Trubek, David M. and Galanter, Marc, 'Scholars in Self-Estrangement: Some Reflections on the Crisis in Law and Development', *Wisconsin Law Review*, vol. 1974: 1062, no. 4, 1974, pp.1062– 1101.
[240] Ghai, 1987, op cit., p.769.
[241] Davis and Trebilcock, 1999, op cit. See Trubek and Galanter, 1974, op cit.
[242] Ghai, 1987, op cit.
[243] Adelman and Paliwala op cit., p.5.
[244] Davis and Trebilcock, 1999, op cit., p.16.

considering methods of reforming legal institutions most dependency theorists seemed to focus their attention on methods of bringing about fundamental political changes in dependent societies"[245]. Dependency theorists within the law and development movement recognised that legal institutions could be used as a tool of oppression by the dominant classes.[246] However, Sammy Adelman and Abdul Paliwala argued in 'Law and Crisis in the Third World', "*Reality...provided a critique in the form of the newly developing countries...whose rapid industrial development confounded the theory.*"[247]

2.2.1.2 Law in Development

The failings in these various movements led to a perceived crisis in law and development theory.[248] However, "*even as the law and modernisation scholars descended into despair, the viability and relevance of law and development was reflected in the alternative research agenda of progressive academics who exposed the limitations of conventional law and development scholarship and demonstrated the possibilities of more appropriate research...above all they demonstrated the importance of analysing law in a broader context comprising both the nation-state and the global political economy, and the advantages of a multi-disciplinary methodology encompassing other social scientific disciplines as well as law*"[249].

The failings of previous theories of law and development, culminating in the 'crisis' in law and development had led to the emergence of the **Law In Development** movement. In this context law was not neutral but could be influenced by surrounding conditions. The idea of transposing Western laws and legal systems into developing countries and assuming that development would follow appeared redundant. As observed by Adelman and Paliwala, this marked a

---

[245] Davis and Trebilcock, 1999, ibid., p.17.
[246] Davis and Trebilcock, 1999, ibid.
[247] Adelman and Paliwala, 1993, op cit., p.5.
[248] See Adelman and Paliwala, ibid. For discussion of the crisis in development theory generally, see also Hettne, 1995, op cit.
[249] Adelman and Paliwala, 1993, op cit., pp.14–15.

'disappointment' for many legal scholars.[250] The Law and Development movement of the 1960s, influenced as it was by Modernization theory, had not required an analysis of the conditions of the countries implementing these new systems of law nor of their effectiveness or consequences. It simply required a top-down use of the law as it existed and, as such, suited the traditional training of lawyers. Analysis of these failures led to the birth of the Law In Development movement, critical legal jurists who called for consideration of law in its wider context and for methodologies outside traditional legal scholarship to be used in law and development: *"There is a realisation imbricated in social relations—it may not be the key to development, but it cannot be ignored either. It is therefore necessary to decentre and refocus the law"*[251].

The work of leading academics in the Law in Development movement was based increasingly on a rejection of the ideals held by law and development jurists particularly in relation to modernisation theory and on recognition of the need to consider law in the context to which it applied. This involved moving beyond the 'black letter' of the law and researching the operation of law in practice and the problems that existed. It also moved increasingly beyond the narrow interpretation of the law set by western developers to recognition of customary laws. In this climate there has been a resurgence of interest in the role that law can play in development, with this new field examining the role of law in a broader context.

An important feature of this legal theoretical perspective is that it has seen a large increase in work carried out by scholars in developing countries. This work has often sought to analyse the problems with the use of the colonial legal system in developing countries and to recognise more appropriate alternatives. For example, the emergence of public interest litigation in India represented a more equitable and achievable way for classes of people to access remedies to injustice than normally available under the common law or civil law legal system.[252] As

---

[250] Adelman and Paliwala, 1993, op cit., pp.14–15.
[251] Adelman and Paliwala, 1993, op cit., p.23.
[252] See Cottrell, Jill, 'Third Generation Rights and Social Action Litigation' *in* Sammy, Adelman and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*. London: Hans Zell, 1993.

discussed by Yash Ghai, work in Africa had sought to "*explore the relevance of law to the problems of social change—how law fits into African conditions. Such an approach requires that one transcends doctrinal or textual analysis and searches for the interaction of law with society*"[253].

An important contribution in this context, and in relation to the present study, has been that of Women's Law. Women's Law originated in Scandinavia in the 1970s with the objective "*to examine and understand how women are considered in law and how the law corresponds to women's reality and needs*"[254]. In Scandinavian Women's Law, there is a need to consider not only the law itself but the reality of that law in society: "*a special problem arises when legislation in certain situations 'runs ahead' of the development in society, and in this way creates an idealistic gap between the factual reality in society and the legal rule*"[255]. This concept of identifying the reality of law 'on the ground' is in line with the work of the Law in Development scholars.

Scandinavian Women's Law, as part of the Critical Legal movement, applies a methodology which moves beyond the 'black-letter' approach of traditional legal training and scholarship to consider the 'law in action' as well as the 'law in books'[256] including the use of empirical data about "*the living facts of women in society and the operation of legal rules*"[257] as well as sources of law including public opinion of what the law is or ought to be, administrative practice and customs.[258] This methodology provided a framework for Women's Law research in Southern Africa. In the African context, however, this took place in conjunction with the need to investigate customary law in **dualist** and/or **pluralist** legal systems. In investigating customary law, the Southern African Women's Lawyers (SAWLs) found that in reality customs and practices were often significant influences on the position of women and their access to and use of legal rights or

---

[253] Ghai, 1987, op cit., p.750.
[254] Dahl, Tove Stang, *Women's Law: an introduction to feminist jurisprudence*. Translated by Ronald L Craig. Oslo: Norwegian University press, 1987. p.12.
[255] Dahl, 1987, ibid., p14.
[256] Dahl, 1987, ibid.
[257] Dahl, 1987, ibid., p54.

obligations. In fact, the 'formal' law was often irrelevant to women, even if potentially suitable remedies were available.[259] For example, Abdul Paliwala identified that despite the introduction of formal legislation providing for financial support to women, following divorce (which had not been available under customary law), the lack of financial support for women had been observed as a growing problem. A number of surrounding factors were seen to have an influence in this respect: "*factors such as cultural inhibitions, ignorance and lack of access to the law*" were considered to obscure the real extent of the problem of limited access to the courts.[260] In Zimbabwe, it was found that a third party, in the form of Social Welfare Agencies, who would not always follow the "technicalities" of the law, were the preferred source of remedy, even where court sources were available, because they were "*informal and free*"[261]. These, it was argued, "*constitute a new and developing system of family law, an addition to the already plural legal orders in most societies*"[262].

The SAWLs considered that in investigating the position of women within pluralist legal frameworks, there was a need to investigate the operation and influence of customs and practices at the different levels of society, since these might be contrasted with the law as applied by the courts.[263] In the context of findings such as those described above, the SAWLs in fact go further and contend that custom and practice should be considered part of a legal framework just as the traditional legal sources are. Concerning legal disputes within the family, for example, the African woman was likely to be "*situated in the intersection between different systems of laws, but also a plethora of normative orders that influence the choices that she can make and the decisions that are reached about her life by*

---

[258] Dahl, 1987, ibid.
[259] See Laycock, Angela M., 'The role of Women's Law in Zimbabwe: from legal activism to African jurisprudence', *LLM Dissertation*, University of Warwick, 1996. p.18
[260] Paliwala, Abdul, 'Family Transformation and Family Law: Some African Developments in Financial Support on relationship Breakdown' *in* Adelman, Sammy and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*, London: Hans Zell, 1993, p.273
[261] Paliwala, ibid., p.293.
[262] Paliwala, ibid., p.293.
[263] Bentzon, Agnate Weis; Hellum, Anne; Stewart, Julie; Welshman, Ncube and Agershap, Torben, *Pursuing Grounded Theory in Law: South- North Experiences in Developing Women's Law*, Harare: Monde Books, 1998, pp. 48–49

others"[264]. In this context, the SAWLs argue, "*Legal pluralism takes on a new meaning, that is of recognising that there are regulatory or normative systems other than the formal law* [state or customary] *that affect and control people's lives...thus the use of the term law is broader than the legal centralist's definition and embraces 'extra' legal forces*"[265]. While the Scandinavian Women's Law methodology called for examination of practices as well as conventional legal sources, the SAWLs have taken this further and suggest that legal sources should include custom and practice. It can be argued that these insights have gone beyond the application of a methodology and have in fact provided a new jurisprudential perspective in which custom, practice, and other factors defining and influencing the operation of the 'formal' law, or constituting norms, should be recognised as 'law'.[266]

This approach, in contrast with the traditional approach to legal research, is inherently 'bottom-up'. A fundamental characteristic of the SAWLs methodology is that investigation into the law should involve not only identifying and understanding the influences shaping the operation of the law and the scope of that law but should also be based on the perspectives of relevant stakeholders: "*legal concepts and theories need to be critically analysed through the medium of women's and men's lived experiences. To do this legal researchers need to have first hand knowledge of local practices and customs in the area they are researching*"[267]. This, in turn, means that legal researchers must be able to gain empirical data and must therefore acquire skills, which they may not traditionally have needed, for example data collection and analysis skills.[268]

It can be seen that some theoretical and jurisprudential perspectives related to the role of law in development have moved towards a recognition that law may influence development but that it does not operate in isolation, and have moved towards 'bottom-up' as opposed to 'top-down' approaches. The need to address

---

[264] Bentzon, *et al.*, ibid., p.40
[265] Bentzon, *et al.*, ibid., p.41
[266] See Laycock, op cit. p.28
[267] Bentzon, *et al.*, op cit., p.25
[268] See Bentzon, *et al.*, ibid., p.25

Biosecurity frameworks at the national level and to identify the actual problems that exist, including in terms of implementation of international agreements has been discussed, (see Chapter 1); the law in development perspective provides the context for the appropriate approach to such an investigation. As identified in the SAWLs research, a number of factors may affect legal frameworks. This, it is submitted, is an important consideration with respect to Biosecurity. For example, attitudes towards import controls might affect the extent to which they are complied with (by importers) and are enforced (by the relevant authority). Although pesticide control legislation may require certain practices by pesticide users these may or may not be observed in reality and there could be a number of factors affecting this.

When considering whether Biosecurity laws are effective and suitable, the researcher considers, therefore, that it is not acceptable simply to take a top-down approach and only to analyse the law 'in the books'. The investigation must take into account the context in which the laws exist and are implemented and enforced. This means that sources beyond positive law, including stakeholder opinions about the law and an investigation of the problems facing those stakeholders in their use and application of the law must be investigated to determine the actual position of the law 'on the ground' including the successes and weaknesses of the legal frameworks being investigated. The various factors influencing and shaping the legal framework should be identified in order to understand whether the law on the books is in fact effective for those affected by it, including the regulated community and the regulatory agencies. The investigation must therefore be designed in a way that allows these wider issues to be identified and understood and should include the views of the various relevant stakeholders.

2.2.2 Methodology: continuing the pursuit of grounded theory in law

Traditionally, legal enquiry has focused on the analysis of 'positive' sources of law— legislation and court judgments. This legal centralism remains the dominant

paradigm amongst 'traditional lawyers'[269]. The present investigation, however, seeks to go beyond this 'top-down' approach to analysis and to investigate the successes and challenges of particular Biosecurity frameworks based on the practical operation of these frameworks at the 'ground level'. This means moving beyond traditional legal methodology to an approach which takes into account the experiences of a variety of stakeholders and the actual problems and successes that occur with the application of the law. The need to extend the traditional methodology employed in legal research is recognised not only academically in the law in development literature described above, but has also begun to be realised on a more practical level. Many of the large international institutions such as UNEP, UNDP and the FAO now include stakeholder participation elements in their projects.[270] This has not necessarily meant involving all relevant stakeholders, or investigation at the ground level, but it does acknowledge the need for a wider investigation of legal frameworks.

Investigation of the law 'in context' has, however, remained relatively limited. One important exception has been the research of the Southern African Women's Lawyers, which sought to investigate some of the problems facing women in terms of utilising and accessing the law. That research applied a methodology for 'bottom-up' legal enquiry which was based on enabling a broad range of influences, including custom and practice, to be identified and understood through the collection of empirical data which extended beyond the sources traditionally recognised by lawyers. This in turn would provide findings which would be useful and relevant for the purpose of law reform. The methodology they adopted for this was *grounded theory.*[271]

Grounded theory is a qualitative research methodology that was 'discovered' by

---

[269] Bentzon, *et al.*, ibid., p.31. For further criticism of the legal centralist approach and the need for, and use of, alternatives to it see pp.49–63.
[270] See FAO, 'Participation in Development' the website of the Informal Working Group on Participatory Approaches and Methods to Support Sustainable Livelihoods & Food Security (IWG-PA) of the Food and Agriculture Organisation of the United Nations (FAO) at <http://www.fao.org/participation/> (03/08/2006), and UNEP, Resources for Civil Society <http://www.unep.org/dpdl/civil_society/> (03/08/2006).
[271] See Bentzon *et al.*, 1998, op cit.

American sociologists Barney Glaser and Anselm Strauss. Their first book on grounded theory, 'The Discovery of Grounded Theory', was published in 1967.[272] Glaser and Strauss noted that, up until that point, "*most writing on sociological method has been concerned with how accurate facts can be obtained and how theory can be rigorously tested*" and that this had been to the detriment of theory development.[273] At the same time, the authors recognised the prevalence, in social research, of 'grand theories'. They considered that theory that was generated from, or **grounded** in empirical data (grounded theory) would avoid the problem that these 'grand' theories could be based on "*dubious fit and working capacity*"[274]. It can be seen that there are parallels between this methodology and the law in development movement described in the previous section: Glaser and Strauss sought to move away from highly abstract theory, based on *a priori* assumptions, towards theory that was readily 'applicable to', and 'indicated by' the data and which was 'meaningfully relevant' and able to explain the behaviour in question.[275]

Anselm Strauss and Juliet Corbin defined grounded theory as:

> *"Theory that was derived from data, systematically gathered and analyzed through the research process. In this method, data collection, analysis and eventual theory stand in close relationship to one another. A researcher does not begin a project with a preconceived theory in mind (unless his or her purpose is to elaborate and extend existing theory). Rather, the researcher begins with an area of study and allows the theory to emerge from the data. Theory derived from data is more likely to resemble the "reality" than is theory derived from putting together a series of concepts based on experience or solely through speculation (how things ought to work)"*[276].

---

[272] Glaser, Barney G. and Strauss, Anselm L., *The Discovery of Grounded Theory: Strategies for Qualitative Research.* New York: Aldine de Gruyter, 1967.
[273] Glaser and Strauss, ibid., p.1.
[274] Glaser and Strauss, ibid., p.4.
[275] Glaser and Strauss, ibid., p.4.
[276] Strauss, Anselm and Corbin, Juliet, *Basics of qualitative research: Techniques and Procedures*

The key characteristic of grounded theory is, therefore, that it emphasises 'theory building' as opposed to hypothesis testing[277] and the generation of theory that is grounded in data.[278] Rather than pursuing a strictly defined avenue of investigation the researcher builds theory based on what emerges from the data. Agnate Bentzon, *et al.*, recognise this methodological approach as one that can facilitate a holistic understanding of law based "*in the reality of human life*"[279]. It can be seen that there is an important link between the theory-building approach of grounded theory and the need for a grounded understanding of the operation of the law as discussed by Bentzon *et al.* This approach seems appropriate to the present study which aims to discover the strengths and weaknesses of Biosecurity frameworks and recognises the need, in pursuing that aim, to identify the perceptions of stakeholders and the 'reality' of the operation of those frameworks. The study seeks to identify the factors that contribute to these strengths and weaknesses, rather than to pursue a strict hypothesis of what is or is not effective. The importance of the grounded theory approach is that it seeks to allow an appropriate theory which 'fits' the data well rather than focusing on a hypothesis which might result in important avenues of investigation being ignored.[280]

Apart from recognising the fundamental importance of theory building, Glaser and Strauss identified certain processes and approaches that would facilitate the 'emergence' of theory and which have come to be recognised as fundamental characteristics of grounded theory. An important overarching principle in this respect is that data collection and data analysis are not wholly separate but rather are iterative processes.[281] The two most significant processes for grounded theory,

---

for Developing Grounded Theory, 2nd edition, Thousand Oaks, London, New Delhi: Sage Publications, 1998. p.12

[277] Glaser and Strauss, 1967, op cit.; Strauss and Corbin, 1998, op cit. and Myers, Greg , *Notes on Grounded Theory*, University of Lancaster, June 2003, <http://bowland-files.lancs.ac.uk/staff/greg/QualRes/NotesonGroundedTheory.htm> (03/08/06)
These publications also provide a useful history and background into the discovery of grounded theory.

[278] Goulding, Christina 'Grounded theory: the missing methodology on the interpretivist agenda', *Qualitative Market Research: an International Journal*, vol. 1 no.1, 1998, pp.50–57.

[279] Bentzon, *et al.*, 1998, op cit., p.25.

[280] See Glaser and Strauss, 1967, op cit. and Strauss and Corbin, 1998, op cit.

[281] Bentzon *et al.*, 1998, op cit., p.18. See Glaser and Strauss, 1967, op cit., p.45 and Chapter 3 more generally.

in this context, are **theoretical sampling** and the **constant comparative method.** Critical to the constant comparative method is the procedure of 'coding' as a means of identifying or labelling key concepts within the data.[282]

Theoretical sampling, identified by Glaser and Strauss, is a fundamental technique to enable the emergence of theory. This non-probability based sampling technique is based on the premise that "*beyond the decisions concerning initial collection of data, further collection cannot be planned in advance of the emerging theory*"[283]. Data collection and analysis should take place simultaneously, as far as possible, so that emerging categories drive data collection. This approach intends to avoid the problem of identifying a sample in advance of data collection which is "*more likely to force the analyst into irrelevant directions and harmful pitfalls*"[284]. The sample is instead selected according to the extent to which it contributes to the emerging theory: "*the basic question in theoretical sampling is* what *groups or subgroups does one turn to* next *in data collection and for* what *theoretical purpose*"[285]. The criteria for deciding when to finish sampling is 'theoretical saturation'. This means that "*no additional data are being found whereby the sociologist [or researcher] can develop the properties of the category*"[286].

The second fundamental procedure is the 'constant comparative method'. In suggesting this method, Glaser and Strauss distinguish it from two common alternatives. In the first of these, coding takes place before analysis and therefore is designed for testing hypotheses, rather than for developing theory. In the second approach the researcher seeks to develop theory and may perceive coding to be an

---

[282] 'Coding' is discussed by Glaser and Strauss, 1967, (ibid.) within the context of the constant comparative method. However, it is recognised that the application of coding procedures is often also identified as a fundamental feature of grounded theory. This is likely to result from the expansion and further emphasis on coding provided by Strauss and Corbin, op cit. (discussed below, in this section). See, for example, Goulding, 1998, op cit.; Cutcliffe, John R, 'Methodological issues in grounded theory', *Journal of Advanced Nursing*, vol. 31, no. 6, 2000 pp.1476–1484; Backman, Kaisa and Kyngäs, Helvi, A.,'Challenges of the grounded theory approach to a novice researcher', *Nursing and Health Sciences*, vol. 1, issue 3, 1999, pp.147–153

[283] Glaser and Strauss, 1967, op cit., p.61.

[284] Glaser and Strauss, 1967, ibid., p.48.

[285] Glaser and Strauss, 1967, ibid., p.47.

[286] Glaser and Strauss, 1967, ibid., p.61.

unnecessary burden. The analysis may, therefore, not be sufficiently systematic.[287] The constant comparative method seeks, accordingly, to address these deficiencies by providing an approach involving the systematic application of coding and analytic procedures which will enable the more systematic generation of theory.[288]

The first stage in this process, according to Glaser and Strauss, is comparing incidents in the data: "*the analyst starts by coding each incident in his data into as many categories of analysis as possible, as categories emerge or as data emerge that fit an existing category*"[289]. The defining rule for the researcher in doing this is, Glaser and Strauss add, "*while coding an incident for a category compare it with the previous incidents in the same and different groups coded in the same category*"[290]. As the coding continues the method will involve a change from comparison of incident to incident to "*comparison of incident with properties of the category*"[291]. Finally, the method will enable the evolving theory to be delimited; the theory is 'solidified' as fewer and fewer modifications arise from the comparisons. The data are also reduced as the theory can be formulated with a smaller set of higher level concepts.[292] Through these processes the method enables the analysis to move towards the development of more abstract, high level categories and the eventual development of theory. Glaser and Strauss consider that the use of the constant comparative method will make it much more probable that the resulting theory will correspond closely with the data "*since the constant comparisons force the analyst to consider much diversity in the data*"[293].

The extent to, and ways in which the techniques and approaches identified in *The Discovery of Grounded Theory* should be applied or can be adapted has been a source of debate amongst grounded theorists even resulting in differing opinions between Glaser and Strauss. In 'Basics of Qualitative Research', Strauss and Corbin elaborate and expand on the procedures available to assist the researcher in

---

[287] See Glaser and Strauss, 1967, ibid., pp.101–102.
[288] See Glaser and Strauss, 1967, ibid., p102.
[289] Glaser and Strauss, 1967, ibid., p.105.
[290] Glaser and Strauss, 1967, ibid., p.106.
[291] Glaser and Strauss, 1967, ibid., p.108.
[292] Glaser and Strauss, 1967, ibid., pp.109–110.

achieving the development of theory.[294] As well as providing a detailed exposition of different stages of coding (Christina Goulding comments that this 'version' of the methodology had been "*reworked to incorporate a strict and complex process of systematic coding*"[295]), Strauss and Corbin discuss in detail the use of other 'analytic tools' such as memos, matrices and diagrams.[296] It should be noted that Strauss and Corbin maintain that the procedures and techniques presented are merely suggestions and are not intended to be used rigidly or prescriptively.[297] Nevertheless, this approach was considered by Glaser to represent a move away from grounded theory towards an approach which would 'force' the data rather than allowing it to emerge.[298] This divergence has been linked to a 'split' in grounded theory, dividing the original presentation of grounded theory (or 'Glaserian grounded theory') with the approach adopted by Strauss and Corbin.[299]

Many researchers, however, simply discuss 'grounded theory' and do not distinguish between approaches.[300] The application of coding procedures and other analytic tools in the present study are discussed in detail in later chapters. It should, however, be noted that in the present case, the researcher has often adopted procedures suggested by Strauss and Corbin. One reason for this is pragmatic; 'Basics of Qualitative Research' provides more detailed description and suggestion concerning how the procedures of grounded theory can in fact be applied. The book was originally designed to teach graduate students how to do "qualitative research" (though it is based only on grounded theory) and is

---

[293] Glaser and Strauss, 1967, ibid., pp.113–114.
[294] Strauss and Corbin, 1998, op cit.
[295] Goulding, 1998, op cit., p.52.
[296] See Strauss and Corbin, 1998, op cit.
[297] See, for example, Strauss and Corbin, 1998, ibid., p.8
[298] See Goulding, 1998, op cit.; Cutcliffe, 2000, op cit.; Wimpenny, Peter and Gas, John, 'Interviewing in phenomenology and grounded theory: is there a difference', *Journal of Advanced Nursing*, vol. 31 no.6, 2000, pp.1485–1492.
[299] See Goulding, 1998, op cit.; McCallin, Antoinette, M.,'Designing a grounded theory study: some practicalities', *Nursing in Critical Care*, vol. 8, no. 5, 2003, pp.203–208; Lomborg, Kirsten and Kirkevold, Marit, 'Truth and Validity in grounded theory — a reconsidered realist interpretation of the criteria: *fit, work, relevance* and *modifiability*', *Nursing Philosophy*, vol. 4, 2003, pp.189–200.
[300] See, for example, Boeije, Hennie, 'A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews', *Quality and Quantity*, vol. 36, 2002, pp.391–409; Backman and Kyngäs, 1999, op cit.

therefore a useful resource for new researchers, as in the present case.[301] The researcher also considers, however, that the techniques and procedures presented by Strauss and Corbin should assist the development of theory but should not, if used sensitively, lead to the 'forcing' of data.[302] Recognising that theory does not simply emerge of its own accord, it seems appropriate to identify the techniques that have, in fact, enabled the theory to emerge.

Grounded theory exists within the interpretative paradigm. In developing theory the original data, for example, the accounts given in interviews, will be interpreted by the researcher. In this respect, Goulding notes that it is important to recognise that "*enquiry is always context based and facts should be viewed as both theory laden and value laden*"[303]. The techniques and procedures fundamental to the development of grounded theory have the aim of ensuring that the eventual theory is in fact grounded in the data. Although the theory will still be 'value laden' because of the interpretative role of the researcher, these techniques should help to ensure that it does in fact reflect what is 'going on' in the data.

The present investigation of national Biosecurity frameworks draws several parallels with the Southern African Women's Law approach in that it seeks to identify opinions, perceptions and experiences of stakeholders and to consider the 'reality' of the operation of laws. In both cases the research is based on an identified need to discover factors affecting the relevant legal framework in reality and not to attempt the production of 'grand theories' based only on examination of centralist sources of law. In both cases the research seeks to provide insights, which, whilst grounded in data, may also be relevant in other circumstances. In the present case, as has already been pointed out in section 2.1, findings may be relevant to other developing countries as well as informing the international trade-environment law debates. Although the methodology of grounded theory in law has thus far only been applied to human rights and women's law, it is recognised, both by the SAWLs and by the present researcher, that its potential application is

---

[301] See Strauss and Corbin, 1998, op cit., p.xii.
[302] See, for example, Goulding, 1998, op cit.
[303] Goulding, 1998, op cit., p.53. See also Cutcliffe, 2000, op cit. and McCallin, 2003, op cit.

wider.[304]. Thus, the clear parallels between the Southern African Women's Law work and the aims of the present study, together with the focus of grounded theory on the emergence of theories rather than the 'testing' of preconceived ideas would suggest that grounded theory is a useful methodology on which to base this study.

The present investigation is based on discovering perceptions and meanings of events for participants, in line with Glaser and Strauss' original methodology. However, in the present case this is done with a view to developing theory about the relevant legal frameworks rather than the social processes involved. It is, therefore, consistent with the application of grounded theory to legal enquiry, developed by the SAWLs. Thus, the investigation primarily seeks to discover stakeholders' knowledge, experiences and perceptions of the legal framework. Such data should provide insights into the effectiveness of the legal frameworks and how identified strengths and weaknesses might inform the development of Biosecurity frameworks in other developing countries.

[304] See Bentzon, *et al.*, op cit., p.26

2.3 BIOSECURITY IN BELIZE

Belize is an English speaking country situated in Central America. It is bordered by Mexico to the North, Guatemala to the West and South and the Caribbean Sea to the East (Diagram 1).

Diagram 1: Map of Belize

The population in 2003 was estimated at 273,700 in an area of 22, 966 square kilometres (8,867 square miles).[305] This means that Belize has a low population density of around ten people per square kilometre.[306] Belize is a multicultural society with the main ethnic groups being Mestizo, Creole, Ketchi, Yucatec and Mopan Mayas, Garifuna and East Indian as well as a number of other minority groups.[307] Literacy levels in Belize are relatively high: Earthscan puts the adult literacy rate for both males and females at 94% (compared with the Caribbean regional average of 85% and 88% for females and males respectively, and World averages of 75% and 86% for females and males respectively).[308]

Belize benefits from good availability of natural resources including coral reefs and large areas of forest. Despite this, there are pressures on environmental resources. The Belize National Human Development Report 1998 identified three main environmental problems: (i) deforestation linked mainly to inappropriate land management; (ii) inadequate sanitation and waste disposal facilities; and (iii) contamination and degradation of water resources.[309] Belize also suffers limitations with respect to infrastructure. Although widely available, electricity is relatively expensive. Roads in Belize have been expanded but access to some areas is still difficult. The small population means that Belize is limited with respect to human resources capacity.

Agriculture is one of the biggest industries in Belize and is the most important economic sector.[310] Sugar, citrus products and bananas are the main agricultural exports while fisheries is an area currently being targeted for growth and

---

[305] Government of Belize, *About Belize* <http://www.belize.gov.bz/belize/welcome.shtml,> (03/08/2006); *<http://www.nationsencyclopedia.com/World-Leaders-2003/Belize.html>* (03/08/2006)
[306] See <http://earthtrends.wri.org/text/population-health/country-profile-19.html> (03/08/2006)
[307] Government of Belize, *About Belize: People*, op cit.
[308] See <http://earthtrends.wri.org/text/population-health/country-profile-19.html> (03/08/2006). See also <https://www.cia.gov/cia/publications/factbook/geos/bh.html> (03/08/2006)
[309] National Human Development Advisory Committee, Sponsored by United Nations Human Development Programme, *Belize, National Human Development Report 1998*, Chapter 2: Status of Human Development in Belize <http://www.belize.gov.bz/library/humandevelopment/chapter2.html> (03/08/2006)
[310] National Human Development Advisory Committee, 1998, ibid.

investment.[311] The United States of America and the United Kingdom are the major export destinations. Another important sector in terms of Biosecurity is tourism. Tourism in Belize is aimed heavily at capitalisation of Belize's natural resources as tourist attractions and eco-tourism is an important market for Belize.

The importance of agriculture and tourism in Belize mean that effective Biosecurity regulation is essential. Belize has been a member of the WTO since 1 January 1995 and has ratified CITES and the CBD. Belize has also been a member of the OIE since 2002, a party to the IPPC since 1987 and is a member of the Codex Alimentarius Commission. With respect to regional agreements, Belize is a member of the Caribbean Community (CARICOM) which includes a Caribbean Common Market.[312] Belize is a parliamentary democracy and has an English common-law legal system.

2.3.1 First phase of investigation: the pesticides control framework

In order to pursue the research problem identified in section 2.1, a preliminary study of the pesticides control framework in Belize was designed. Pesticides control is an important aspect of Biosecurity, impacting as it does on human, animal and plant health and safety and the environment. Pesticides control is important with respect to human health because of both the possible effects of using and handling pesticides and the potential effects on food safety in the form of pesticide residues which can be in both plant and animal products. In respect of animal health, pesticides can have an impact through agricultural use, such as the use of veterinary pesticides and through wider pesticide use affecting habitats, for example by contaminating food and water sources. The effects on plants are perhaps the most obvious since pesticides are most commonly used to control

---

[311] National Human Development Advisory Committee, 1998, ibid.

[312] CARICOM came into effect in 1972 and replaced the Caribbean Free Trade Agreement. "*The objectives of the Community, identified in Article 6 of the Revised Treaty, are: to improve standards of living and work; the full employment of labour and other factors of production; accelerated, coordinated and sustained economic development and convergence; expansion of trade and economic relations with third States; enhanced levels of international competitiveness; organisation for increased production and productivity; achievement of a greater measure of economic leverage and effectiveness of Member States in dealing with third States, groups of States and entities of any description and the enhanced co-ordination of Member States' foreign and foreign economic policies and enhanced functional co-operation*", see

plant pests for agricultural purposes (for example, in the form of herbicides, fungicides, nematicides). These pesticides will affect other plants with which they come into contact, though these plants may not be the intended target. Pesticides can also affect the environment generally: a common example of this is through the contamination of water sources through run-off of pesticides from agricultural land. Pesticides may also affect plant and animal species by entering the food chain. The need to place controls on the importation of pesticides and for related trade restrictions was discussed in Chapter 1. It is, therefore, essential, for the purposes of Biosecurity, that pesticides are properly regulated and controlled.

Belize has had a pesticides control framework in place since 1985 when the Pesticides Control Act (PCA) was originally introduced. The original reason for the introduction of the Act was as a response to evidence of pesticide residues in meat and citrus products, which was a threat to export markets.[313] The pesticides control framework consists of the PCA and subsidiary legislation and the Pesticides Control Board (PCB), a statutory body under the authority of the Ministry for Agriculture, with responsibility for the implementation and enforcement of the Pesticides Control Act. The PCB is governed by a Board of Directors which is responsible for authorising registrations and licences for the purposes set out in s.4(1) of the PCA (as amended). The Board (of Directors) consists of 14 members comprising representatives of both the private and public sectors including producers associations, various relevant Ministries and six members appointed on the basis of having knowledge of agriculture and/or pesticides (Schedule One, as amended).

The Pesticides Control Act, in the course of its history, has introduced a number of substantial provisions aimed at controlling all aspects of pesticides including handling and use, importation and manufacture and distribution. One of the first provisions to be introduced was a system of registration for pesticides whereby

---

<http://www.caricom.org/jsp/community/community_index.jsp?menu=community> (03/08/2006)

[313] See Black, R., 'The Development of the Pesticides Regulatory System', *LLM (Research) dissertation*, University of Greenwich. 1999.

pesticides entering Belize must be registered as regulated, restricted or prohibited. Subsequent legislation makes provision for the conditions that apply to all areas of pesticide handling according to which of these categories a particular pesticide falls. The PCA provides for a licensing system for the import, manufacture and sale of pesticides and for the certification of pesticide users, with certification issued on the basis of their complying with safe use requirements specified in the regulations.[314] Training may be provided prior to the issuance of a certified user licence.[315]

The introduction of a complete framework for pesticides control has been a considerable benefit to Belize in terms of the control that can be exercised over the use and distribution of pesticides. The introduction of a framework that is actually operative can be measured as one success of pesticides control in Belize. The Pesticides Control Act and subsidiary legislation has been revised a number of times since its original implementation in order to meet new challenges as they have arisen.[316] However, a number of concerns related to pesticides control in Belize have been identified. The Belize National Human Development Report 1998 cites run-off of fertilisers and pesticides as one of the biggest menaces to the reefs.[317] There has also been anecdotal evidence about pesticide intoxication and it is thought that this may be a serious problem.[318] There was some concern related to the operation of the PCA, including on-going debate about the appropriateness of representation of the pesticides industry on the Board and the lack of formal procedures for enforcement of the Act.[319]

The reasons for the initial implementation of the Pesticides Control Act are known. The Pesticides Control Act and the Pesticides Control Board have received local and international recognition for its successes. Writing in 1999, Dr.

---

[314] Statutory Instrument No. 112 of 1996: Restricted Pesticides (Certified User) Regulations, 1996.
[315] See SI 112 of 1996, Schedule 1.
[316] For a detailed history of the development of the pesticides control framework see Black, 1999, op. cit.
[317] National Human Development Advisory Committee, 1998, op cit. Chapter 2, op cit., see 2.06: Tourism
[318] See Black, R., 1999, op cit.
[319] See Black, R., 1999, ibid.

Robert Black cited several sources of this recognition. "*Respect for PCB's achievements has come from environmental and academic figures in the region, from FAO and from the Ministry...Furthermore, the PCB has been able to win financial and logistic support from the United States aid programme, from the Pan American Health Organization (PAHO) (under PLAGSALUD) and from the British aid programme...*"[320]. The recognition both of concerns, outlined above, and of apparent successes made the pesticide control framework a useful and appropriate area of study since the intended aim of this research was to investigate and to evaluate the strengths and weaknesses of Biosecurity frameworks.

Another interesting feature of the framework is that the approach to implementation and enforcement is known. Implementation has been gradual due to limited resources but this has allowed for other activities such as training and public awareness campaigns to run alongside the implementation of specific provisions. It has been suggested that this has been one of the key elements to the success of the PCA since stakeholders were made aware of the existence and importance of new provisions rather than having them imposed on them without warning or explanation.[321] The approach to enforcement has been based on co-operation and compliance rather than on the use of sanctions and penalties. To date no one has been prosecuted for offences under the Pesticides Control Act.

Previous studies

In 1998 Michelle Cranwell undertook a study of farming practices in the Cayo District of Belize.[322] The aim of the study was to "*assess and compare pesticide practices of both certified and uncertified* [pesticide] *applicators*"[323]. At the time, the pesticides control training program was ten years old while the pesticide user certification program had only existed for three years. The study found that many farmers did not follow safe pesticide practices, even where protective equipment

---

[320] Black, 1999, ibid., p.66.
[321] Black, R, 1999, ibid.
[322] Cranwell, Michelle, '*A Pilot Study, assessing and comparing pesticide management practices among certified and uncertified farmers in four villages within the Cayo District, Belize*'. University of Vermont, Burlington. College Semester Abroad, 1998.
[323] Cranwell, 1998, ibid., see 'abstract'.

was available; that farmers might go to sources other than the Ministry of Agriculture for advice on pesticide use and that farmers were often illiterate or unable to read the pesticide label because it was in a language which they did not speak. Disposal of empty pesticide containers was also thought to be a problem. These are important issues in the context of the pesticides control framework and indicated areas where the PCA and PCB may be failing to achieve effective pesticides control. It was hoped that the present work would contribute to an understanding of whether these issues are still perceived to be problematical.

Cranwell also recognised that members of the PCB and the Belize Ministry of Agriculture (Belize MoA), as well as the Ministries for Health and the Environment had expressed the view that pesticide use by small scale, traditional farmers and possible adverse affects in terms of food safety were also areas of concern. These concerns represent a different perspective from the initial emphasis on large scale farmers producing export commodities as in the original implementation of the PCA. Again it will be worthwhile to consider to what extent these different concerns have subsequently been focused on. The two have (at their root) essentially different Biosecurity objectives; securing export markets and protecting domestic health and safety. If either of these is neglected or overlooked then the PCA may fail to achieve some of the objectives of pesticides control.

Cranwell's study identified some important issues in relation to the success of the pesticides control framework. However, its focus was on the identification of farmers' practices, for example, the likelihood of their wearing personal protective equipment (PPE) during pesticide application. It did not explore what pesticide users or other stakeholders think of the Pesticides Control Act and other problems they may have in terms of compliance. Though the study certainly provides useful data about pesticide practices in the Cayo District and highlights particular areas of concern, it does not provide enough information to comment on the successes or failures of the pesticide control framework.

An investigation of the pesticides control framework in Belize could, therefore, provide an important contribution to the study of national Biosecurity frameworks. There was a need to discover whether this framework could in fact be said to be successful; to what extent the issues that have been identified were actually causing problems for stakeholders or whether in fact there were other issues that were causing problems in terms of compliance and/or enforcement. This information would allow the effectiveness and success of the approaches to enforcement and implementation and the reasons for this to be considered.

Aims

The aim of this study of the pesticides control framework in Belize was to consider the extent to which the implementation and enforcement of the Pesticides Control Act could be said to be successful in terms of achieving the objectives of that Act. This was to be achieved by identifying aspects of that framework that were successful and aspects that presented challenges. Identification of actual problems or successes, based on stakeholders' experiences and their perceptions and opinions of the PCA and PCB, would enable consideration of the effectiveness of the legislation and the framework as a whole, including implementation and enforcement. The study therefore aimed to identify particular problems that stakeholders have with enforcing or complying with the PCA as well as positive experiences or benefits that have been realised and to consider what the possible causes of, and reasons for these, are. This data would be used to consider the overall strengths and weaknesses of the framework.

Objectives

This investigation of the pesticides control framework in Belize has been pursued through consultation with stakeholders at all levels to ascertain:

(i) opinions, perceptions and experiences of the PCA;

(ii) opinions, perceptions and experiences of the PCB;

(iii) knowledge of the purpose and aims of the PCA and PCB;

(iv) knowledge of provisions of the Pesticide Control Act and subsidiary legislation that affect the way they can use or handle pesticides;

(v) provisions of the Pesticides Control Act with which they have trouble

complying or enforcing (as appropriate).

2.3.2 Second phase of investigation: the Belize agricultural health framework

The present framework for the regulation of agricultural health in Belize was established under the Inter-American Development Bank's (IDB) Modernization of Agricultural Health Project. This project emphasised the importance of accessing foreign markets within the context of the need to comply with WTO rules and the requirements of importing countries.[324] The primary objective of the project was to "*enhance the competitiveness of Belize's agricultural products, especially in foreign markets*"[325].

A further key objective of the project was to "*improve the quality and financial viability of animal and plant health services*"[326]. This was to be achieved "*without a significant increase in the present level of Government expenditure, meeting the cost of further improvements from increased private sector fee income*" [327]. An important characteristic of the new framework, therefore, was that it would operate primarily on a cost-recovery basis, with minimal financial input from the Government. Other objectives of the project were to reduce losses from disease, to ensure the safety and quality of agricultural products for both domestic and foreign consumers and to achieve these aims through increased private sector participation.[328]

The establishment of the Belize Agricultural Health Authority (BAHA) was one component of the 'institutional strengthening' aspect of the project. This aspect also provided for 'active private sector participation' through the Board of Directors and through 'user groups'. Other components included improving public awareness of plant and animal health matters, promoting private sector technical services, improving the collection and distribution of information on agricultural and food-related diseases and pests, recommending improvements to existing

---

[324] Inter-American Development Bank (IDB), *Modernization of Agricultural Health Project*, Project No.BL0003, 1999, Executive Summary. See 'description' p.1.
[325] IDB, 1999, ibid., 'objectives', p.1.
[326] IDB, 1999, ibid.
[327] IDB, 1999, ibid.

legislation and providing producers with a greater role in monitoring the quality of laboratory services.[329]

The new regulatory framework was implemented through the Belize Agricultural Health Authority Act 2000 (the BAHA Act). This Act established BAHA as the statutory authority responsible for the regulation of agricultural health, under the authority of the Ministry for Agriculture. Under this new framework the various components of agricultural health, particularly the plant protection and animal health services, were regulated by one authority (BAHA), as opposed to being regulated on a sectorial basis, as had formerly been the case. Sectorial legislation, for example the Plant Protection Act and the Animal (Diseases and Importation) Act, were repealed.

Under the BAHA Act, BAHA is governed by a Board of Directors consisting of eleven representatives from various ministries, producers associations and private sector representatives, and the Managing Director, who is responsible for the day-to-day management of BAHA (but who does not have voting rights on the Board). In operational terms, BAHA is composed of separate units for each area of agricultural health including plant health, animal health, quarantine and food safety. (Food safety became a distinct part of BAHA later, see page 118, below). Key parts of the Act include

- The Administration of Plant Health (Part VI), providing for control of the importation of plants and plant products
- Plant Quarantine Measures (Part VII), providing for the designation of quarantine pests and for measures for the prevention and control of plant pests and diseases
- Enforcement (Part VIII), concerning measures to be taken at entry points and other areas in relation to plant pests and diseases and quarantine pests
- Control of Diseased of Suspected Animals (Part IX), providing measures for the control of animal diseases

---

[328] IDB, 1999, ibid.
[329] IDB, 1999, ibid., 'description' pp. 1–2

- Importation of Animals, Animal Carcasses, Animal Products, Biologicals, Feed and Litter (Part X), providing for the control of the importation of these products
- Fertilisers and Feeding Stuffs (Part XI), providing for the licensing and sale of these products.

Subsequent to the enactment of the BAHA Act, a number of regulations were introduced (or consolidated), under the Act, to make further regulatory provision for these areas. Under the general powers of the Act regulations for food safety were also introduced, under SI No. 25 of 2001.[330] This regulation designated BAHA as the competent authority for the inspection and approval of all food safety 'enterprises' and for controlling food safety systems.

The regulation of agricultural health by one authority, rather than on a sectorial basis, represents a move to an integrated approach to the regulation of agricultural health, potentially leading to improved standards of regulation by avoiding some of the problems that can arise when regulation takes place separately, such as overlapping activities and a lack of information sharing.

It has been seen that the creation of BAHA took place within the context of the need for Belize to comply with WTO rules and the requirements of importing authorities. In this context, the facilitation of agricultural exports and the compliance with international obligations is an important aspect of BAHA's work. As well as the adoption of internationally accepted standards, through requiring the implementation of HACCP systems by exporting food processors, BAHA also provides certification and documentation for commodities for export.[331]The enquiry point for SPS is positioned within BAHA and although Belize's Biosafety framework is still in development, BAHA is Belize's focal point for the Cartagena

---

[330] Implemented under sections 86(1) (uu) and (ww) of the BAHA Act.

[331] HACCP is defined by the codex Alimenatrius Commission as a "*system which identifies, evaluates, and controls hazards which are significant for food safety*". See Codex Alimentarius Commission, 'Food Hygiene: Basic Texts (2003), see also Codex Alimentarius Commission, *Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application*, Annex to the Recommended International Code of Practice – General Principles of Food Hygiene

Protocol (with the Ministry for Natural Resources being the focal point for the CBD).

Domestic agricultural health objectives also exist, however, and legislative measures related to these objectives (as well as to maintaining export markets) include import controls for the prevention of pest and disease entry and internal pest and disease surveillance programs. Specific programs are in place for the monitoring and control of the Mediterranean Fruit Fly (Med fly), and for the Pink Hibiscus Mealy Bug. These pests are of significance for Belize's export markets as well as for local plant health and production.

In 2003 the author assisted with the consultancy project, 'Strengthening Existing Legal and Regulatory Provisions for Plant and Animal Health and Food Safety'. This project was funded by the Inter-American Development Bank (the IDB) under the Modernization of Agricultural Health Services Project. During the course of this work a number of difficulties were identified, including inadequate legislative provision for some important aspects of the framework and other difficulties related to the legislative provisions, overlapping and conflicting mandates with other authorities (mainly in relation to the regulation of food safety by the Public Health Department), and some technical difficulties such as the imposition of fees and fines and the application of a permit system for imported commodities.[332]

The Belize agricultural health framework provided an opportunity to evaluate the strengths and weaknesses of a relatively new framework, one which has introduced a number of novel components. The study of this framework would enable the investigation and evaluation of the success of these concepts. The extent to which the concepts and issues described above have led to difficulties or benefits for stakeholders in terms of the regulation of agricultural health, including

---

[332] See Black, R and Outhwaite, O, *Strengthening Existing Legal and Regulatory Provision for Animal and Plant Health and Food Safety*, Consultancy Services to the Belize Agricultural Health Authority for the Modernization of Agricultural Health Services Project, Final Report 31 August 2003.

compliance and enforcement issues, could be identified. The extent to which the agricultural health framework could be said to be successful, including in terms of meeting the aims and objectives specified in the implementing project and BAHA's mandate could also be identified and explored. The reasons for this could also be considered.

Aims

The aim of the study of the agricultural health framework in Belize was to consider the extent to which the implementation and enforcement of the BAHA Act could be said to be successful in terms of achieving the objectives of that Act and the overall objectives for the regulation of agricultural health as specified in the project implementing the new framework. This was to be pursued by attempting to identify aspects of the framework that were successful and aspects that presented challenges.

The study attempted to identify problems and successes for stakeholders in complying with or enforcing the provisions of the BAHA Act and to investigate any positive aspects or benefits arising for stakeholders. For this purpose, the study aimed to investigate stakeholders' perceptions, experiences and opinions of BAHA and the BAHA Act. This information would be used to identify areas of the agricultural health framework that are, or are not, working and to consider possible causes and explanations for this. Further to this, the study aimed to investigate the impacts and issues arising from the national implementation of international trade and environmental agreements as relevant to agricultural health.

Apart from identifying specific issues related to the agricultural health authority, this second phase of fieldwork was intended to provide a comparative aspect for the overall study. The findings of the BAHA study would be compared with those of the PCB study in order to identify similarities and differences and to allow for discussion of approaches to Biosecurity more generally, using Belize as a case study.

Objectives

This investigation of the Belize agricultural health framework has been pursued through consultation with stakeholders at all levels to ascertain:

(i) Opinions, perceptions and experiences of the BAHA Act

(ii) Opinions, perceptions and experiences of BAHA

(iii) Knowledge of the purpose and aims of the BAHA Act and BAHA

(iv) Knowledge of the provisions of the BAHA Act and subsidiary legislation

(v) Provisions of the BAHA Act with which they have trouble complying or enforcing (as appropriate).

(vi) Knowledge and perceptions of international agreements affecting agricultural health.

Chapter 3: Data Collection

It has been seen, in Chapter 2, that two phases of investigation were carried out for the purpose of the present study. In this chapter the specific tools and processes used to collect data for these investigations, including aspects of the design and implementation of these methods will be discussed. Planning and sampling issues, the implementation of the fieldwork design through specific data collection methods and the ethical concerns and limitations of the data collection will also be reviewed.

3.1. IDENTIFYING APPROPRIATE METHODS

As has been discussed in Chapter 1, the traditional, positivist, data sources for legal enquiry are legal texts: legislation, case law and perhaps academic writings. In the case of the present study it was important that the data collection methods employed were consistent with the grounded approach to investigation. The data collection methods, therefore, had to allow for the identification of issues and problems in the frameworks being studied without 'forcing' the outcome of the investigation. The methods and procedures applied in the design of the fieldwork and collection of data were intended to enable the emergence of theory and to avoid unnecessarily limiting the scope of the investigation.

Though debate about the relative benefits and limitations of both qualitative and quantitative research rages in many fields of research, for the purposes of the present investigation qualitative methods of data collection were preferable to quantitative methods. The primary reason for this was the avoidance of a hypothetico-deductive approach, a characteristic of quantitative investigation, which would inhibit the emergence of important themes. In describing the concept of 'fit' in grounded theory, Glaser succinctly expresses a problem which the present research sought to avoid: "*In the process of most preconceived research — such as that for testing hypotheses — data, which cannot be either forced or selectively picked, is discarded, rather than used to correct the category*"[333].

---

[333] Glaser, Barney G., Theoretical sensitivity: advances in the methodology of grounded theory, The Sociology Press: Mill Valley, California, 1978, p.4.

Whilst this problem (or aim, according to the research) can arise through a qualitative approach to data collection it was considered that it could be avoided through the selection of appropriate methods. Of perhaps greater importance, an understanding of the significance of the various issues, and the way in which these interact, from the stakeholder perspective, would be difficult to generate through the use of quantitative methods.

3.2 FIELDWORK PLANNING AND DEVELOPMENT

3.2.1 Access

Access to stakeholders for the purpose of carrying out interviews and other data collection was a consideration in the design and planning of the fieldwork. In designing the investigation, the researcher sought the support of both the Pesticides Control Board and the Belize Agricultural Health Authority. It was both ethically and practically important to have the support of these regulatory agencies so that the investigation could be carried out effectively: this support not only enabled access to Board members and the staff of the agencies for the purposes of interviewing but also facilitated the inclusion of other stakeholders through the assistance provided by the agencies, particularly administrative support and the provision of transport. In both instances the agency was contacted at a very early stage in planning the fieldwork and subsequently a formal study proposal was presented. This outlined the nature and scope of the investigation as well as the stakeholders that should be involved and the resources that would be required. The researcher had contacts in both the PCB and BAHA, as a result of prior consultancy work, and therefore making initial contact was not difficult. Although the researcher sought the co-operation of the agencies, it was agreed and made clear at the outset that the content of the interview questions and other data sources could not be restricted by either agency.

In the first phase of fieldwork, the PCB agreed to help facilitate the investigation on the basis that they would benefit from an external study of the PCB since they themselves were intending to address some enforcement issues. During initial

discussions into the possibility of an investigation of the pesticides control framework the Registrar suggested that the PCB had been thinking about enforcement issues and had identified three particular areas which they considered to be "priority" areas. These areas were (i) the aerial application of pesticides; (ii) improvement of facilities for pesticide rebottling and storage; and (iii) empty pesticide container management. Therefore, an issue in the research design was how, if at all, to include these concepts without affecting the ability to identify other relevant issues. It was decided to incorporate these issues into the research design on the basis that the existence of issues identified by the PCB as 'priority' issues would provide an important way to compare the perceptions and opinions of the PCB with those of other stakeholders. The three priority issues would be specifically incorporated into the interviews but only after other questions whose responses might be affected by the mention of these categories had been asked. The significance of these issues to all types of stakeholders was investigated further through the use of a 'ranking sheet' in which participants were asked to categorise the importance of each of these areas in terms of how much of a problem they considered them to be. (See section 3.3.3 below).

Gaining the support of BAHA was somewhat more difficult. Soon after the initial contact had been made, the BAHA Board of Directors changed and the researcher was advised that there might be a delay before the idea was considered. Eventually, the Board agreed to the study but with some restrictions, primarily relating to the reporting of findings, which the researcher did not feel could be fully accommodated. However, at this stage a formal proposal had not been submitted. Once it had been, these issues were resolved and the researcher was able to proceed.

Securing the support of the regulatory agencies meant that transportation and logistical support was provided to the researcher in the field. This made the task of gaining access to individual stakeholders immeasurably easier and meant that, besides the constraints of time, accessing individuals was not a problem. There were potential problems with access regarding the extent to which language

and literacy barriers might be a problem when contacting producers. This was of greater concern in the PCB study, since a number of small vegetable farmers, to whom those concerns primarily related, had to be contacted. Discussion with the PCB in the research design stage suggested that these issues were unlikely to limit the study substantially since the majority of Belizeans speak English and basic literacy is relatively high. Therefore, a wide sample of stakeholders could still be accessed. Where literacy was a problem the interviews could go ahead but follow-up work could not be carried out.

In the event, literacy did not cause a problem in terms of the interviews or ethical considerations but did limit the extent to which the 'ranking sheet' could be used (see section 3.3.3). Language was an issue to some extent since many of the vegetable farmers are Spanish speaking. Although some vegetable farmers interviewed were English speaking, the decision had to be taken whether to exclude Spanish speaking farmers from the investigation or to include them by way of using a PCB technician as translator. Doing so could potentially influence the interview responses. It was decided that Spanish speaking farmers should be included since they, as a clearly identifiable group, could bring different opinions and insights to the study. The possibility of biased responses due to the presence of the PCB technician was not thought to mitigate the usefulness of the interviews since the interviewees were told the purpose of the study and the confidential nature of the interview and significant useful information still could be collected, even with the possibility of bias. For example, knowledge of the requirements for handling pesticides was unlikely to be affected by the presence of the technician.

3.2.2 Piloting the study

A formal pilot study, to test the data collection methods, was not carried out in advance of either field visit. Though such a pilot would have been desirable, restraints in the form of time and resources available, particularly taking into account the location of the fieldwork, prevented the implementation of a full pilot study. Prior to the PCB study, one pilot interview, including use of the ranking sheet, was carried out in order to check for consistency and errors in the questions and other materials and to check logistical factors such as the length of the

interview. The other factors which could have been highlighted by a pilot were specific to the interviewees. These included cultural issues, including the researcher's and the participant's accent, the appropriateness of the question phrasing in cultural terms and the relevance and clarity of the questions in terms of the specific position/experience of the interviewee. For example, questions aimed specifically at technicians could not be piloted on anybody other than a technician. For the purposes of the BAHA study, lessons learned from the first phase of fieldwork were used to refine the interview questions, for example, omitting particular words or phrases that had caused difficulty in the first phase of fieldwork and incorporating phrases which had seemed preferable to stakeholders.

In the event, it was decided to consider the first interview for each category of stakeholder as a pilot and to carry out necessary revisions on that basis. The researcher made notes following those interviews in response to any difficulties that had arisen. This applied to both the PCB and BAHA studies. Minor adjustments to questions were made in several interview categories, not only in response to the pilot but also in response to the ongoing process of interviewing and the particular interview situations. This was particularly important for the BAHA study in which the individuals falling within the same category sometimes varied greatly in terms of experience and background, particularly in the case of private sector participants (producers and processors). The adjustments made were minor, usually a slight rephrasing or explanation of questions in order to maximise suitability. Any amendments were made with a view to preserving the overall structure, content and comparability of the interviews.

Specifically related to the 'pilot' interviews, amendments were made to the interview questions for inspectors and pesticide retailers in the PCB study. These revisions were aimed at ensuring that the researcher gathered the data in a suitable manner and that the participants were made to feel more at ease by not being asked questions which they could not be expected to answer.

3.2.3 Sampling

Whereas in quantitative studies random sampling techniques are applied in order to produce statistically representative sample populations, this is not necessarily the case for qualitative studies. One reason for this is that the nature of qualitative enquiry, in terms of the time needed to collect and analyse the data, means that practically it is difficult to adopt such sampling strategies.[334] A further reason is that in carrying out qualitative research the researcher will be less concerned with the general applicability of the data and more concerned with ensuring the relevance of the sample population.[335]

It has been seen (in Chapter 2) that the proposed sampling strategy for grounded theory is **theoretical sampling**. It was considered that this approach was well suited to the research requirements (as set out in Chapter 2) and could be successfully used with the chosen data collection methods. The prior knowledge and resources available to the researcher meant that 'convenience' sampling was not necessary. Simple quota sampling was inappropriate, however, since the researcher did not have *a priori* determined sampling figures and this would not necessarily enable the most effective pursuit of stakeholders, from the perspective of their ability to contribute to theory development.

In theoretical sampling the cases to be included are determined as part of the research process — new groups or cases may be included or targeted as further insights are gained.[336] Strauss and Corbin describe theoretical sampling in terms of the sampling of incidents, concepts or events, whilst they also state that theoretical sampling can and should be employed "*when exploring new or*

---

[334] See Silverman, David, *Doing Qualitative research: A practical Handbook*. London, Thousand Oaks, New Delhi: Sage Publications, 2000. p.102.

[335] For example, popular qualitative sampling strategies such as snowball sampling, purposive sampling and theoretical sampling all have the aim of ensuring that the data collected is of use and relevance in addressing the research question as opposed to it necessarily being generalizable to a particular population. In implementing these strategies the researcher explicitly targets particular settings, occurrences, individuals and so on, a practice which would be unacceptable in random, quantitative, sampling strategies. See Patton, Michael Quinn, *Qualitative Research & Evaluation Methods*, 3rd edition, Thousand Oaks, London, New Delhi: Sage Publications, 2002. p.230; Neuman, W. Lawrence, *Social Research Methods: Qualitative and Quantitative Approaches*, 5th edition. Boston: Allyn & Bacon, 2003. p.211.

[336] See Strauss and Corbin, 1998, op cit., Chapter 13.

uncharted areas"[337]. In practice it must be recognised that, when exploring new areas, the researcher may not, as in the present case, be working with concepts at the outset, and will therefore sample people and groups. Concepts may begin to emerge as sampling continues and the researcher may then begin to adapt the approach to sampling to pursue these. This issue is identified by John Cutcliffe, who notes that the distinction between 'theoretical' and 'purposeful' sampling is often blurred or even ignored by qualitative researchers and that initially sampling is likely to be purposive but not concept or theory driven.[338] Strauss and Corbin do, however, recognise that one of the initial considerations in data collection is identifying a "*site or group to study*"[339]. In the present case, several groups of stakeholders were identified prior to the commencement of data collection, each based around a particular regulatory framework.

The total number of interviews carried out, and the breakdown by stakeholder group, is shown in Tables 3.1 and 3.2. In the case of the PCB, the members of the Pesticides Control Board and the staff of the Secretariat were clearly essential stakeholders. Further stakeholder groups were developed through the researcher's own prior knowledge of the field and through consultation with the PCB. Pesticide retailers were targeted at two levels — the Directors of the two agro-chemical companies (together representing the 'pesticides industry') and the smaller scale retail outlets selling pesticides throughout Belize. Pesticide users were to be consulted. These were identified primarily through type of farming activity and this, in turn, allowed for the targeting of different sizes of farms and different geographical distributions of pesticide users. The types of farmers included banana, citrus, papaya, sugar cane, vegetable and the Mennonite farmers producing beans and grains. This covered all of the main agricultural products.

Also targeted were various producers associations who might provide a different perspective to that given by individual farmers and also provide more general insights into issues facing farmers and other pesticide users. Relevant government

---

[337] Strauss and Corbin, 1998, op cit., p.202.
[338] Cutcliffe, 2000, op cit.
[339] Strauss and Corbin, 1998, op cit., p.204.

departments and ministries were also identified, including the Belize Agricultural Health Authority, the Ministry of Agriculture, the Ministry of Health and the Ministry of Environment. 'Civil Society' was targeted in the form of both NGO and 'urban' dwelling community members who might be exposed to different aspects of pesticide use and control and who ultimately contribute to the funding of the PCB (albeit in a minor capacity) through payment of taxes. The final group of stakeholders were quarantine inspectors who were the first point of contact for people arriving into Belize and bringing pesticides into the country. A list of specific departments or groups that would be targeted for interview was drawn up in advance. However, it was not determined that all of these stakeholders must be included. Similarly, numbers to be targeted were not predetermined. These would depend on both the practicalities of the field research and the need to pursue particular avenues as theoretical issues arose.

For the BAHA study, a similar approach to sampling was taken. Groups were identified in advance and BAHA were consulted, though ultimately provided less input in the identification of stakeholder groups than the PCB (partly because the researcher, following the first phase of fieldwork, was more aware of these different groups). In the case of the BAHA study, several decisions were taken, in accordance with the sampling strategy, based on the need to follow up issues that had arisen from prior knowledge, particularly the PCB study. However, the investigation of BAHA also needed to provide an opportunity for new issues to arise and to provide data specifically relevant to that agency. Again BAHA Board members and the staff of BAHA were clearly essential stakeholders. In the latter case, there were more technical staff involved than there were with the PCB and these were employed in a greater diversity of roles.

The starting point for the identification of further stakeholder groups was the BAHA Act — stakeholders which should, according to the Act, have some type of contact or relationship with BAHA were identified. The private sector was, of course, an important group — whereas in the case of the PCB this had pertained mainly to pesticide users, in the case of BAHA the basis of inclusion was

involvement in agriculture generally (including agricultural health) and therefore included food processors as well as producers. It was unknown at the outset whether it would be necessary, or relevant, to target differently sized farms and plants; a factor which would have to be determined as the fieldwork progressed. In the event, it was felt that, taking into consideration time restraints, small vegetable producers should not be specifically targeted, as they had been for the PCB study, as they were unlikely to have had contact with BAHA and could therefore provide only limited input in that context.[340] This was a good example of the application of theoretical sampling: these stakeholders were excluded in favour of others, who, it was considered, would contribute more to the development of theory.

Issues arising from the PCB study had indicated that relevant government departments and ministries was an important stakeholder group to include in the BAHA study. The identification of stakeholders within that group was led by the sampling that had taken place for the PCB study. Producers associations and civil society were also identified as relevant, however, in the case of the latter, it was considered important that regional development agencies were specifically targeted but that the general public (community members) need not be targeted. Whilst that sector of the population may indeed have provided useful insights, it was felt that this was less relevant than the inclusion of other stakeholders (described above). Since there were many more individuals and sub-groups in the stakeholder categories described than there had been in the PCB study, it was felt that the resources had to be used pursuing these groups and indeed, this decision was not contradicted as issues emerged in the field. This again illustrates the application of theoretical sampling on a broader level (based on insights from the first phase of fieldwork and other background information) but also the need to take into account the time and resources available for data collection.

It should be emphasised that these were categories identified prior to commencement of the data collection and the actual targeting of individuals and emphasis on different stakeholder groups was led by the emergent issues in the

[340] This was based partly on the researcher's previous experience of BAHA but also on the advice

field. At times it was felt that a particular group had been 'saturated'; the same issues were repeatedly identified and eventually, therefore, the group did not need to be pursued further.[341] On other occasions, the researcher felt that interesting insights had been provided by a particular individual and other individuals were consequently targeted, based on the pursuit of those ideas. For example, comments in some interviews (in the second phase of investigation) that good progress had been made in the meat industry and that stakeholders had been able to 'come on board' and support BAHA naturally led to the targeting of 'service users' within the meat industry. In accordance with the grounded theory framework, the sampling also became more deliberate in the second phase of fieldwork. Whereas in the first phase no concepts or theory had been identified prior to the investigation and the researcher therefore took a very open approach to sampling, in the second phase, the researcher was aware of the concepts that had arisen from the PCB study. The researcher was, therefore, able to make more informed sampling decisions, realising more readily when categories were saturated and identifying interviews which would enable greater investigation of a particular issue or further comparative analysis (as described above). It is considered that this approach is consistent with the aims of theoretical rather than purposeful sampling since cases were pursued according to the extent to which the interviewee considered they could contribute to the developing theory — either by providing new insights or by adding to, or contrasting with, existing insights rather than by targeting individuals based on other criteria.

The main restraint on the strict implementation of theoretical sampling was the degree to which the analysis could take place at the same time as the data collection. As has been seen in Chapter 2, Glaser and Strauss present the ideal approach as involving systematic analysis of the data at the time of, and

---

of the Managing Director.

[341] Although often full 'theoretical saturation' could not be achieved, in the sense that the researcher felt that there were other stakeholders who could provide important insights, but these could not be included because of time restraints. Also, it was sometimes difficult, particularly in the first phase of fieldwork, to recognise when 'saturation' had been achieved.

throughout, the data collection phase.[342] However, although the sampling was guided by theoretical considerations, in the sense that "*individuals, groups etc. [were] selected according to their (expected) level of new insights for the developing theory*"[343], the practicalities of the short time-frame in which the data had to be collected (due to the geographical location of the fieldwork) meant that no more than a basic review of the interviews could be carried out during the process. Of course, the second phase of fieldwork was driven by the experience and results of the first phase and in this respect was based on analysis of earlier data.

Table 3.1 Breakdown of interviews carried out for the PCB study (by stakeholder group)

Category of Stakeholder	Number of interviews
Pesticide users	18
Pesticide retailers	3
Agro-chemical industry representatives	2
Civil society	4
Government/ministry representatives	6
PCB technicians	4
Producers association representatives	4
'Other' stakeholders	6
	Total: 47

[342] Glaser and Strauss, 1967, op cit. See Chapter 2. This is also considered by Strauss and Corbin to be an important aspect of the sampling strategy (see Strauss and Corbin, 1998, op cit.). However, some authors place less emphasis on this characteristic of the data collection; see Neuman, 2003, op cit., p.215, Flick, Uwe, *An introduction to qualitative research*, 2nd edition, London, Thousand Oaks, New Delhi: Sage Publications, 2002. pp.65–67.
[343] Flick, 2002, ibid., p.65.

Table 3.2 Breakdown of interviews carried out for the BAHA study (by stakeholder group)

Category of Stakeholder	Number of interviews
Private sector (agricultural producers and processors)	16
BAHA technical staff	13*
Producers association representatives	5
Regional bodies and NGOs	7
Government officials	6
	Total: 47

* BAHA technical directors and other BAHA technical staff were identified and interviewed under separate categories. However, for the purposes of analysis those categories were merged in order to preserve the anonymity of participants. Seven technical directors (including BAHA MD) and six other technical staff (inspectors and officers) were interviewed.

3.3 DATA COLLECTION METHODS

3.3.1 Interviews

Since the aim of the fieldwork was to investigate stakeholder perceptions and to explore and reveal relevant issues, the data collection methods had to enable and not prohibit the open exchange and collection of data. The use of closed questionnaires or other highly prescriptive data collection tools would, it is suggested, have limited the investigation of stakeholder experiences.

The formats available for interviewing vary from completely unstructured through to structured.[344] In the present case, the researcher wished to pursue specific areas of enquiry. Although the concepts had not been identified prior to the initial fieldwork, areas of enquiry which should facilitate the pursuit of the research question, but with a sufficient degree of flexibility and openness, were identified. Also, opportunities for follow up interviews were unavailable due to time and logistical restraints and it was therefore important that certain key areas were covered in the first interview. Structured interviews were therefore used in both

[344] For example, Patton identifies these in terms of 'the informal conversation interview', 'the interview guide' and 'the standardized open-ended interview'. See Patton, 2002, op cit. Similar labels apply throughout the literature.

phases of fieldwork. As noted by Michael Patton, the use of structured interview questions provides for consistency across interviews.[345] This was a desirable feature for the present study since it allowed some degree of comparability of responses and this was helpful in order to compare and contrast experiences of different stakeholders and thus identify and evaluate strengths and weaknesses within the framework, as per the study aims.

In practice, flexibility is required when conducting interviews in order to take advantage of interviewing opportunities that arise. The researcher, therefore, allowed for the introduction of further prompts or questions as relevant to interviewee responses. Further, interview guides were devised which listed the issues to be covered. In the event that the interview did not follow the standard structure, an interview guide could be used to "*ensure that the same basic lines of enquiry [were] pursued with each person interviewed*"[346]. In some interviews the interviewee was keen to share particular opinions or experiences and the list of questions became somewhat redundant. The interview guide allowed the interviewee to use prompts to ensure that important areas were not missed.

As noted by Lawrence Neuman, the focus in field interviews in on "*the member's perspective and experiences*"[347]. In the present study, the interview questions were designed to be open ended to facilitate this and to avoid limiting interviewee responses. The design of effective open-ended questions required a number of considerations to be addressed. Patton considers that "*in qualitative enquiry, "good" questions should, at a minimum, be open-ended, neutral, singular, and clear*"[348]. The steps described below were intended to result in the design and use of "good" questions.

Though the identification of types of question varies among researchers, the concept of structuring and ordering questions to achieve effective outcomes is

---

[345] Patton, 2002, ibid., p.343.
[346] Patton, 2002, ibid., p.343.
[347] Neuman, 2003, op cit., p.391.
[348] Patton, 2002, op cit., p.353.

commonly recognised.[349] In the present case, the questions were structured with the aim of including more descriptive or 'easier' questions in the earliest stages of the interview so that the interviewees would not feel intimidated by the interview process or feel that they were not able to provide a sufficient response. The actual questions depended on the type of stakeholder being interviewed, for example, private sector stakeholders, interviewed in relation to BAHA, were initially asked to describe the type of production or processing they were involved with. By contrast, government officials were asked the general question, "In your opinion, what is the purpose of regulating agricultural health in Belize?" This question allowed the interviewees to start with a broad response but was also intended to prevent the interviewees feeling that they were wasting time since the question is clearly relevant to the research area.

Interviews were broken down into sections with each section being linked by the researcher with a transitional statement. For example, a section on 'the relationship of BAHA with other departments and bodies' was introduced, and distinguished from the preceding section with a statement such as ,"I'd like to ask you, if I can, a little bit more about the involvement of other bodies with agricultural health". (See BAHA Board Member interview questions, Appendix 3). The aim of this was to provide the interviewee with a sense of progress and direction throughout the interview. It also provided an opportunity to pause briefly so that the interview did not become too monotonous. Within these sections, the questions were generally organised to move from being relatively broad to being more specific and from asking for description to asking for opinions. The transition of questions was also organised to avoid the identification of things which might be relevant to later responses (for example, mentioning the Pesticide Control Act before asking a farmer whether he or she was aware of any laws or controls), and to avoid the assumption of prior knowledge on the part of the interviewee.

---

[349] Neuman, for example, identifies three types of interview question, while Patton identifies six; both discuss the significance of the ordering of questions. See Neuman, 2003, op cit., pp.393–394 and Patton, 2002, op cit., Ch 7. See also Flick, 2002, op cit., Ch 8.

Questions were designed to be as clear and unambiguous as possible, and to be singular. For example, questions pertaining to 'problems and benefits' were separated into two questions. In order to enhance the clarity of questions, the language used sometimes had to be adapted to suit the experience or background of the interviewees. For example, in the PCB study the interviewer originally used the question, 'In your opinion, has the regulation of pesticides brought you any particular benefits?' (This was contrasted with, 'In your opinion, has the regulation of pesticides brought you any particular problems?') In several interviews the interviewee was clearly uncomfortable with the term 'benefits' or did not provide a response. The interviewer realised that, for reasons still unknown, this word was unsuitable, and the word 'advantage' was generally substituted instead.

In contrast with survey interviews, which seek to elicit clear and accurate responses but which do not diverge from the set interview structure,[350] in the present case, prompts were used to encourage the interviewee to elaborate on answers and additional questions were introduced in order to pursue topics and incidents initiated by the interviewee. As more interviews were carried out, with the use of the constant comparative method, 'markers' were recognised by the interviewer — these are references to particular concepts or experiences which the interviewee considers to be important or which warrant further discussion.[351] For example, in one interview the interviewee commented, in relation to animal health services, that they do not use BAHA and that "*I'd rather get a person, 'cos we have some people outside that do the job for we, you know that cuts the pigs and things like that*"[352]. This appears to the interviewer to indicate a limitation on the use of BAHA's services as well as a possible negative perception of BAHA and accordingly follow up questions, about why the interviewee would not use BAHA, could be asked.

Interviews typically lasted around 30–40 minutes, with the BAHA study

---

[350] See Neuman, 2003, op cit., esp. p 391.
[351] See Neuman, 2003, op cit., p.392.
[352] BAHA interview 36.

interviews being slightly longer than the PCB interviews, due to the broader range of issues covered. Separate question lists and interview guides were designed for each stakeholder group in order to allow for the content and wording of the questions to be suitably targeted. In the case of the PCB study the stakeholder types initially identified, for the design of interview questions, were:

- Pesticide users;
- PCB Board members and technicians (with supplementary questions used in the case of technicians);
- Civil society;
- Ministry representatives (government officials); and
- The commercial sector (pesticide retailers).

During the course of the fieldwork representatives of producers associations and 'other' stakeholders emerged as relevant groups with different interview needs. In these cases, the interview questions were chosen according to the situation and based on those considered to be most relevant by the researcher.

In the BAHA study questions were designed and used for:

- Private sector stakeholders (producers and processors);
- Government officials;
- BAHA Board members;
- BAHA technical staff;
- BAHA technical directors;
- NGOs and regional bodies; and
- Producers associations.

In both phases of fieldwork four 'core' questions were used in the same format in all of the interviews (the questions were different for the two phases of fieldwork). These questions were designed to allow for the emergence of key issues and were implemented in the same way in all interviews so that some definite comparisons could be made.

3.3.2 Stakeholder workshops

To enable some degree of triangulation and as an alternative way to explore the

issues, a stakeholder workshop was held in both phases of fieldwork. The concept of the stakeholder workshop draws some parallels with the use of 'focus groups' in the sense that they may be considered a form of group interview (particularly in the case of the second workshop) and that a key characteristic of the workshop is that "*unlike a series of one-to-one interviews, in a focus group participants get to hear each other's responses and to make additional comments beyond their original responses*"[353]. The aims of the workshops were to provide an opportunity for the discussion of issues which the researcher had not yet identified, by allowing the content to be driven by participants, and to provide another opportunity to explore some of the key issues that had already been identified. It was considered that the exploration of issues in a group setting and with a less directed approach than that used in interviews, might allow for elaboration on particular issues and for further insights to emerge. Commonly, a series of focus groups is held, for example as the primary data source or to supplement a survey.[354] In the present case, the workshop was held as a further source of data collection but the use of only one session was felt to be sufficient to explore the issues as required.

In both cases formal invitations to the workshop were sent in advance to identified stakeholders. Stakeholders were identified and targeted in the same way as for the individual interviews, that is, according to their ability to contribute to the area being studied. The stakeholder groups had been identified by the time of planning the workshops. The researcher produced a list of bodies and organisations, based on these stakeholder groups, from which individuals should be invited. In both cases the researcher worked with the regulatory agency to identify the relevant individuals to be contacted, for example, directors of agro-chemical companies, and representatives of producers associations. The researcher was further assisted by the respective agencies with the distribution of formal invitations, written by the researcher, and with follow up telephone calls once the researcher was in the

---

[353] Patton, 2002, op cit., p.386.
[354] See Krueger, Richard A., *Focus Groups: A practical Guide for Applied Research*, 2nd edition, Thousand Oaks, London, New Delhi: Sage Publications, 1994. pp 16–17; 2002, op cit., p.385 and Neuman, 2003, op cit., p.396.

field. Various stakeholders were invited to the workshop including all Board members (and, in the case of BAHA, technical directors), representatives from relevant Ministries and governmental departments, producers associations, NGOs and other regional bodies represented in Belize. The diversity of participants was intended to allow for representation of different perspectives and contrasting opinions.[355] Private sector individuals who were not Board members or representatives of producers associations or particular communities (the Mennonite community) were not invited; representation in the form of producers associations was thought to be more appropriate for the purposes of this particular aspect of data collection. A record of invited stakeholders was kept.

In the case of the PCB study, thirty-six people were invited with hoped for attendance of around twenty. Twenty-four people confirmed anticipated attendance but in the event only thirteen did attend. This was to some extent a limiting factor since clearly fewer views were represented than perhaps would have been ideal. However, in the event, the workshop still provided valuable information and it was considered that to some extent the lower than expected numbers had in fact been beneficial: a number of different stakeholder groups were represented and the lower numbers meant that the proceedings were perhaps more manageable in terms of the attendees being able to make their views known and to discuss these views in sufficient detail and within the time available. In the case of the BAHA study, thirty-eight people were invited, with anticipated attendance of around fifteen. In the event there were eleven participants. Again attendance was lower than expected and was possibly affected by a number of other agricultural health events taking place at the same time (unknown to the researcher until arrival in the field). Nevertheless, the researcher considered that a useful and effective session was carried out on that occasion also.

The PCB workshop was a half-day event consisting of a 'plenary' session and a 'group work' session. In the former, the researcher asked open ended but specific questions and used a flip-chart to note issues and as a focal point for the

---

[355] Regarding the composition of focus groups see Krueger, 1994, op cit., pp.77–78.

discussion. In the second session, participants were divided into groups and asked to produce a short 'presentation' covering those issues given in the agenda and including any other comments they wished to make. Originally, it was intended that there would be five groups, grouped according to field of work/interest. In light of the lower than expected attendance, participants were split instead into two groups based on public or private sector representation. Throughout the morning the emphasis was on allowing the participants to steer the discussion and to identify relevant issues and themes with the researcher providing minimal substantive input. The researcher was assisted by the PCB Registrar. Though, to avoid influencing the responses, the Registrar did not become involved in the discussion, she did address and correct some specific issues at the end of the session. The Registrar considered that it would be "dangerous" to allow people to come away from the session with particular, incorrect, views about some aspects of pesticides control, such as the scope of legislation, and these were therefore addressed.

In the BAHA workshop the format was less formal and more discussion based with participants seated together at a round table and discussion prompted by the facilitator. This was a different format to that adopted in the PCB study. One reason for this was because the researcher considered that a less formal structure would be more appropriate because of the smaller group size. Also, having undertaken a workshop for the PCB study, the researcher felt that a less formal structure might increase the level of discussion between participants. In this workshop the participants were provided with handouts displaying questions (for guidance but not to be adhered to rigidly) and with space to write notes next to the questions. Participants were advised that these could be handed in to the facilitator at the end of the session. Theses handouts were used to provide the participants with a provisional structure and frame of reference for the discussion and to provide an opportunity to pass on further comments to the facilitator, which the participant may not have wished to share with the group.

In group based sessions, such as in the stakeholder workshop, the process and

outcomes of the session are very much dependant on the role and effectiveness of the facilitator. Richard Krueger notes that "*the researcher serves several functions in the focus group: moderating, listening, observing, and eventually analyzing...*"[356] These roles (with the exception of analysing), were linked by the preparations made by the facilitator prior to the workshop and the responses of the facilitator during the event.

As in the design of interview questions, the researcher attempted to ensure that the questions used in the workshops were appropriately worded, open ended and presented in a logical sequence. In a similar fashion to the design of interview questions, the questions set out for the BAHA study and the plenary session of the PCB study were designed to allow for transition from introductory questions to key questions.[357] The questions used in the group work session of the PCB study also followed a logical sequence but were more specific since the 'introductory' issues had already been covered in the preceding session.

During the workshops the researcher needed to exercise sensitivity and flexibility in order to pursue the discussion of relevant topics but to limit the diversion of participants to irrelevant topics. The discussion also had to be directed to allow all participants the opportunity to respond and to prevent the conversation being dominated by one or a few participants. Further the researcher, as facilitator, had to ensure that momentum was maintained, by introducing new questions at appropriate times. Another important function of the facilitator was to prevent conversations or topics developing in such a way that one group, in particular the regulatory agency, may have felt that they were being 'attacked'. This was an issue only to a very limited extent but was important not only in terms of the success of the workshop but also in maintaining ongoing positive relations between the researcher and the regulatory agencies.[358]

---

[356] Krueger, 1994, ibid., p.19.
[357] This design was guided by the categories recognised by Krueger; opening questions, introductory questions, transition questions, key questions and ending questions. See Krueger, 1994, ibid., pp.54–55.
[358] The necessity of these attributes in a facilitator, and 'moderator skills' generally are discussed in detail by Krueger, 1994, ibid., Chapter 6.

3.3.3 Survey data

In the PCB study a supplement to the interviews in the form of a small survey, referred to in the present case as a "ranking sheet", was used. Prior to entering the field some specific 'priority areas' had been identified to the researcher by the PCB (see section 3.2.1); the ranking sheet was adopted to gauge stakeholder views on these problems. It was considered that this could form a supplementary source of data by providing a further insight into a small range of very specific issues. It was also considered that this would provide some further triangulation of data, through the investigation of these specific areas through another method.

Since this method was not being used for a full survey, the measurement scale used on the sheet was less significant but needed to allow for a sufficient degree of variation between responses. A summated rating scale, with five possible ratings, was used. Richard Hessler notes that this type of scale is more difficult to validate "*in the sense of demonstrating that there is a particular dimension or dimensions underlying the items and that the respondents respond along these dimensions*"[359]. However, in the present case, only an indication of the differences in attitude was sought, with the deeper insights being gained through the individual interviews. Other scales, such as the popular Likert scale were considered unnecessarily complex and involved for the present purpose.[360] It was, therefore, considered that the summated rating scale was appropriate. Since only a very few number of items were listed, all being measured in the same way, it was not necessary to order the items in any specific way.

Neuman lists ten principles of good (survey) question writing.[361] To the extent that these were applicable to such a small survey, the design of the ranking sheet was intended to meet these criteria. The wording of the sheet was intended to be

---

[359] Hessler, Richard M. *Social Research Methods.* St Paul: West Publishing Company. 1992. p.80.
[360] The Likert scale is a five point scale in which responses are classified from 'strongly agree' to 'strongly disagree'. For further explanation see, for example, Hessler, 1992, ibid., p.81.
[361] 1. Avoid jargon, slang and abbreviations; 2. Avoid ambiguity, confusion and vagueness; 3. Avoid emotional language and prestige bias; 4. Avoid double-barrelled questions; 5. Avoid leading questions; 6. Avoid asking questions that are beyond the respondents' capabilities; 7. Avoid false premises; 8. Avoid asking about future intentions; 9. Avoid double negatives; 10. Avoid overlapping or unbalanced response categories. See Neuman, 2003, op cit., pp.268–273.

unambiguous and appropriate for the targeted stakeholders. The 'problems' listed were singular to prevent confusion and ineffectual rankings. Examples were provided above the ranking table and full instructions were also written above the table with the intention of ensuring that the respondent was clear about the survey requirements before responding. The ability of participants to respond was not thought to pose a problem since the issues were specifically covered in the preceding interview. The ranking sheet was designed to compare the perceived seriousness of different problems associated with pesticide use. The sheet listed the three areas identified by the PCB as priority areas for enforcement. This provided a further way of investigating whether the PCB's perceptions of pesticide problems matched those of other stakeholders. On arrival in Belize, a fourth category, the "quality of labelling and packaging", was identified and this was added to the ranking sheet.

The interviewer did not show the participant the ranking sheet until the end of the interview in order to prevent preconceptions about what the interviewer was looking for in terms of interview responses. Time was taken to explain carefully what the participant was required to do and how the ranking system worked. Nevertheless, the sheet was not suitable for use after every interview. Some farmers did not have the level of literacy required to fill out the sheet while its availability only in English precluded its use with Spanish speaking farmers. On some occasions, participants were confused about what they were being asked to do: some participants thought that they were being asked to rank how important it was to regulate that issue as opposed to how significant a problem it was. With hindsight, the wording used (regarding the use of the term 'important') is likely to have limited understanding of what was required and perhaps could not be overcome despite the provision of a verbal explanation. Every effort was made to ensure that the ranking sheet was used in appropriate circumstances and that participants fully understood what they were being asked to do. However, because of these stated limitations, the ranking sheet was not used with every interview and some responses are less valid because the participant did not appear to

understand the purpose of the sheet. In the event, data collected through this method was not incorporated into the main body of findings, but was used only for reference.

No ranking sheet was used for the BAHA study. There had been no identification of the very specific type of issues which would be suitable for investigation by this method, as there had been with PCB. Further, since the sheet had been of limited value in the PCB study, it was not considered worthwhile pursuing it in the BAHA study. The investigation of issues through interviews and the stakeholder workshop (see below) was thought to be sufficient.

3.3.4 Documentary data

Where available, documentary sources of data were collected and reviewed. Since the availability of such materials was limited and not suitable for inclusion in the main body of data (since it was not directly relevant), this source was used for reference, as a supplementary source of data.

Publicity and educational documents published by the PCB were collected in order to assist in building up an overall picture of the work of the PCB and the image that it was attempting to portray. Copies of other reports on pesticides control in Belize and the PCB were also collected. Reports that had not been available to the researcher prior to entering the field were shown to the researcher and provided further information of interest. Documentary data was even more limited in the case of BAHA. Publicity materials were again used to provide background information, though fewer examples of such material were available than for the PCB. A further report was made available to the researcher on the understanding that it was also for background information only and that no copies were to be made.

3.4 ETHICAL ISSUES AND LIMITATIONS

3.4.1 Recording the data

Wherever possible, interviews were recorded in order to achieve an accurate

record of the interview, which could also be transcribed at a later date. Permission from the interviewee was sought before any recording was made (see below). In some situations, the interviewees indicated that they did not wish to be recorded. In those situations, the researcher explained that this was acceptable but that the interview would take longer since it would have to be recorded by hand. In these situations, the researcher attempted to write the interviewee's responses verbatim, asking for clarification or repetition where necessary. Question responses were clearly separated and the corresponding question number written in the margin to ensure that these responses could be properly interpreted after the event.

The nature of the field work meant that interviews were sometimes carried out in conditions that were less than ideal for the purpose of recording. This was unavoidable but the effect was lessened by using good quality equipment.[362] Nevertheless, in some recordings, there are interruptions or other noise which distort the response. Notes were taken by the researcher throughout each interview to provide another, albeit less detailed, recording of the interviewee's responses. This was sometimes used for guidance when transcribing the recordings. These notes were also used in the small number of occasions where the interview was not recorded due to researcher error.

The stakeholder workshops were not recorded in audio format since it was thought that this would be impractical (in terms of reviewing the data) because of the number of participants: the researcher would not have been aware which participant was speaking and to ask participants to introduce themselves before doing so would ruin the dynamic. In the PCB workshop the PCB Registrar assisted by taking notes straight on to the facilitator's laptop so that there was a record of proceedings and points raised, with identification of the participant. This provided a supplement to the 'flip-chart' notes taken by the researcher and OHP notes presented by the groups in the second session. In the BAHA workshop the

[362] Interviews were recorded using a MiniDisc recorder used with an external microphone. This allowed the researcher to prescribe and list the commencement of each interview by track number, which made identification and review of interviews easy.

facilitator did not have assistance with note taking but made comprehensive notes by hand.

The researcher also took notes outside of the recording of interviews, during both field visits. This 'field diary' focused primarily on practical issues such as access, planning, and problems or issues that arose during the course of the visit. Some notes on emergent themes, questions and general observations were also recorded to assist with the ongoing sampling and data collection.

3.4.2 Ethics

Certain ethical considerations existed in the design and implementation of the study due to the involvement of individual participants. Though participants were not asked to discuss topics that were particularly sensitive or emotive, they were asked to comment on their experiences and opinions about government bodies and the extent to which they were aware of, and supported, the relevant regulatory frameworks. The participants were, therefore, vulnerable regarding the possible consequences if the information they provided were to be passed on to the relevant bodies or other relevant personnel. To address this issue, and to reassure the participants, the researcher took steps to ensure that participants would not be disadvantaged thorough their participation and that they were properly informed about what their participation would involve. Neuman considers that "*[a researcher] has a moral obligation to ensure the confidentiality of data*"[363]. In the present case, the confidentiality of data collected through interviews and the ranking sheet was assured. The researcher ensured that the interviewees were aware of the nature and purpose of the study in seeking their participation. The design of data collection materials was also intended to avoid emotive questioning. Although questions did involve participants sharing opinions and experiences, these did not pertain to highly sensitive or personal topics, and some ethical concerns, for example, the extent to which confidentiality could be genuinely assured, were therefore largely irrelevant.[364]

---

[363] Neuman, 2003, p.397

[364] Patton, for example, describes the problems of participants seeking advice when discussing traumatic personal issues, or the problem of assuring confidentiality when the researcher theoretically could be asked to testify in court. See Patton, 2002, op cit., pp.405–406.

The researcher ensured that informed consent was obtained prior to participation of an individual in data collection. Prior to the interview beginning, interviewees were presented with a 'permission for interview' sheet. This described the purpose of the interview and context of the overall study and introduced the researcher. The purpose of the investigation and the fact that it was being carried out with the support of the relevant agency was provided. The estimated length of the interview was also stated. This information had to be introduced briefly but with sufficient clarity to ensure that it was understandable.[365] The sheet provided a space for the interviewee to sign, date and print his/her name. The confidential nature of the interviews was also explained verbally to participants prior to commencement of the interview.

The 'permission for interview' sheet also stated why the interviewer wished to record the interview and provided space for the interviewee to provide or withhold permission for this. When interviews were recorded, the interviewee was informed that recordings would be used only by the researcher, for the purpose of accuracy in data analysis. In the case of interviews in which a translator, in the form of a member of staff of the relevant agency, was involved, the issue was more difficult. The situation generally arose in relation to vegetable farmers for the PCB study. The confidential nature of information provided was emphasised but the presence of a technician or other member of staff could clearly be difficult for the participant. In fact, in these situations, the participants did not seem concerned. The researcher did, however, ask the translator to explain that any information that was provided would not result in action being taken by the agency. This was agreed with the PCB Registrar and technicians prior to any such interviews being carried out. Although the presence of a technician may have limited the responses provided by participants, the assurances should have ensured that their position was not compromised in any way.

Confidentiality was ensured at the data analysis and reporting stages of the study

---

[365] Patton notes that "*Statements of purpose should be simple, straightforward and understandable. Long statements...are usually either boring or produce anxiety*". See Patton, 2002, ibid., p.407.

by disassociating collected data with the names of participants. Participants were identified only by number (for example, 'interviewee one'), by stakeholder type (for example, 'private sector') or by Board membership status ('Board' or 'non Board').

In the case of the BAHA study, there were some considerations regarding the reporting of findings. When negotiating access to the field, and the support of BAHA, it was apparent that the Board was concerned about potential adverse effects resulting from the publication of negative perceptions or critical findings. The researcher went through a process of consultation with the agency, particularly through the presentation of a formal study proposal, to reassure its officials that the aim of the study was to investigate strengths and weaknesses of the framework as a whole and not to provide a critique of the agency. The agency agreed to the formal proposal but nevertheless it appeared that there were some Board members who were still concerned. Nevertheless, the researcher had to be forceful in maintaining that findings could not be limited in any way in terms of publication. A compromise agreed upon was that the researcher was prepared to provide the agency with copies of potential publications and to report feedback received from them (but maintaining full reporting on findings). Findings would relate to the stated study aims, would be presented "in good faith and with accuracy" and would not focus on party political issues (which were not part of the study focus or expected to be relevant).

3.4.3 Limitations and bias

The study was not intended to be statistically representative of the whole population, or even of the population of particular stakeholder types (namely the private sector) in Belize. It should, therefore, be remembered that the data collected is intended to provide a certain depth of insight and does not necessarily reflect the views of the population as a whole.

Whilst the researcher was satisfied that all of the relevant stakeholder groups had been consulted, practical and financial considerations prevented the interviewing of urban dwelling citizens whose insights would have been useful. In the case of

the PCB study, the researcher was unable to include in the sample farmers in the Toledo District (most of whom are banana farmers). In the case of the BAHA study, many of the private sector interviewees were involved with aquaculture or livestock production and processing a fact which resulted in less emphasis on the plant health components (though producers from relevant sectors such as citrus and papaya were included). The banana industry and small vegetable farmers, in particular, were not included in the sampled population. The duration of the visit on each occasion was two weeks and within the set time frame it was simply not feasible to make these contacts without sacrificing others.

The possibility of bias existed in the present study as it does in most investigations. In designing and implementing the data collection phases of the study a number of measures were taken to reduce the possibility of bias. Measures described above, regarding the design of interview, workshop, and survey questions were intended to reduce the possibility of bias by ensuring that these methods of data collection were objective and open-ended and did not lead the participant to any particular response.

Bias could have been a factor on the part of the participants since the researcher was a non-Belizean young woman and also was introduced as a doctoral candidate. In contrast, the majority of participants were men and were older than the researcher. Particular views may, therefore, have been formed by the participants about the researcher, which affected their responses. Further, the researcher was always accompanied by one of the PCB technicians, in the case of the first phase of fieldwork, and usually by a member of BAHA staff in the second phase. These personnel made the relevant introductions but did not sit in on the interview, except when translating. The researcher attempted to make it clear to participants that the study was supported by the agency but was not being undertaken for them. Nevertheless, the initial presence of the technician or other member of staff may have affected the participant's responses.

Bias on the part of the researcher was a possibility. The researcher's supervisor

had been heavily involved with the PCB over several years and some reports on the work of the PCB, including the supervisor's LLM Dissertation and the Cranwell study,[366] had been reviewed by the researcher prior to the field work. In the case of the BAHA study, the researcher had been involved through consultancy work with BAHA prior to undertaking the present research. These factors allowed for the possibility of pre-conceived ideas affecting the data collection. However, as seen in earlier sections, every attempt was made to ensure that this was not the case since such preconceptions would limit the validity of the data.

[366] Cranwell, 1998, op cit.

Chapter 4: Data Analysis Procedures

In this chapter the procedures and techniques applied for the purposes of data analysis are reviewed. Though the overarching methodological approach to data analysis was that of grounded theory, in order to develop and utilise this methodology in analysis of Biosecurity frameworks, a mixed-method approach was adopted. The chapter begins with a discussion of the rationale for, and criticisms of, this approach. The specific techniques for each of the two types of analysis, grounded theory and content analysis, and the way that they were applied in the present study are then described. This is followed by an account of the use of computer-assisted qualitative data analysis software (CAQDAS), beginning with an overview of identified concerns with respect to the use of such software. Some specific software packages and the process of selection are then discussed. This discussion is then followed by a detailed review of the application of the chosen software in the present case, while the final section addresses the issues of validity and reliability.

4.1 A MIXED-METHOD APPROACH TO DATA ANALYSIS

As discussed in Chapter 2, the overarching methodology of the present study was grounded theory. As part of the process of achieving grounded theory, however, the researcher adopted a mixed-method approach to data analysis. As well as applying grounded theory techniques, as described by Strauss and Corbin,[367] content analysis was adopted as a method of data analysis. There has been some criticism of mixed-method research, focussing generally on the problems of mixing both qualitative and quantitative methods, because of the important paradigmatic differences of these approaches — positivist versus constructivist — and the problem of mixing these for the purpose of investigation. For example, Joanna Sale *et al.* question how results obtained through both quantitative and qualitative methods can be similar if "*the two paradigms are supposedly looking at different phenomena?*"[368]

---

[367] Strauss and Corbin, 1998, op cit.

[368] Sale, Joanna EM, Lohfeld, Lynne H. and Brazil, Kevin, 'Revisiting the Quantitative-Qualitative Debate: Implications for Mixed-Methods Research', *Quality and Quantity* vol. 36, 2002, pp.43–53. p.47

This criticism assumes that both quantitative and qualitative approaches are applied separately but used to measure the same phenomena for example, two separate studies, one qualitative and one quantitative are carried out and the two distinct sets of results are compared. However, in the present case, the two approaches to data analysis were integrated so that they formed one overarching data analysis approach. Both approaches to data analysis (grounded theory analysis and qualitative content analysis) take place within the qualitative paradigm in the sense that it is recognised that the presence of the researcher affects the 'findings' since interpretation, rather than mere measurement, is involved. The aim of the mixed-method approach was to enhance the data analysis by using differing analysis methods. This enabled the data to be interpreted and reviewed from different perspectives and provided opportunities for the researcher to investigate and to re-evaluate the inferences and theories that were developed. In essence, content analysis was incorporated as a way of pursuing grounded theory: the application of content analysis codes was not to quantify qualitative data or statistically to test hypotheses; it was used as a way to interpret, investigate and develop further theory which had emerged from other stages of analysis.

4.2 DATA ANALYSIS TECHNIQUES AND PROCEDURES

4.2.1 Data Analysis and grounded theory

4.2.1.1 Key characteristics of grounded theory analysis

As is the case for the pursuit of grounded theory in overall terms, the essence of data analysis in grounded theory is in working with collected data to develop theory that is not wholly abstract or conceptual but is grounded in that data. The approach and procedures applied and adapted in the present research project are based on some of those suggested by Strauss and Corbin in their text '*Basics of Qualitative Research*'[369]. Whilst their approach has been criticised by Strauss' co-discoverer of grounded theory, Barney Glaser, other researchers have recognised

[369] Strauss and Corbin, 1998, op cit.

and accepted both Glaser's and Strauss and Corbin's approaches to be valid.[370] For the purposes of the present study, the approach of Strauss and Corbin was not considered to be too prescriptive but rather was viewed as a toolkit to be adapted as appropriate for the study. Whilst this approach is perhaps more structured than that originally presented by Glaser and Strauss, it was considered that it would be helpful in enabling the researcher to analyse the data and to develop a theory that was well-grounded in that data

In Chapter 2, certain characteristics of grounded theory which are considered to be fundamental to the methodology were introduced, for example, theory building rather than hypotheses testing and the 'emergence', rather than the 'forcing', of data and theory. However, it is recognised that the techniques which are used to achieve this should not be rigidly and uniformly applied to all projects in the same manner but rather that they should be applied appropriately, according to the aims and objectives of the particular research project.[371] Nevertheless, certain 'techniques' of grounded theory are commonly identified and considered necessary for the proper application of the methodology. These include the constant comparative method and theoretical sampling. It has been seen, in Chapters 2 and 3 that these apply to all stages of research, not only to data analysis.[372] The specific application of these techniques to the analysis stages of research should, however, be considered in detail at this stage.

The way that these techniques were applied in data analysis is demonstrated through examination of the final important method (perhaps more significant in Strauss and Corbin's approach than in the original presentation of grounded theory) — that of 'coding'.[373] Coding provides a 'way in' to exploring the data. It begins with the labelling of manifest incidents, moves to coding at a more

---

[370] See Chapter 2.
[371] Strauss and Corbin, 1998, op cit.
[372] See Strauss and Corbin, 1998, ibid., p.42 and Goulding, 1998, op cit., p.54.
[373] It has been seen in Chapter 2 that this is not considered as a stand-alone technique in *The Discovery of Grounded Theory* but was elaborated by Strauss and Corbin and is often specifically referred to in literature discussing grounded theory.

conceptual or abstract level and finally facilitates the building of theory.[374] An important characteristic of grounded theory coding is that data is not 'forced' into one category or another; codes can, and do "*legitimately belong to and cut across numerous cases*"[375]. The basic coding processes in grounded theory are **open, axial** and **selective** coding. However, though subject to different classifications for descriptive purposes, these stages of analysis cannot easily be separated and frequently they overlap.

4.2.1.2 Open coding

Open coding is "*the analytic process through which concepts are identified and their properties and dimensions are discovered in data*"[376]. In the open coding phase of analysis the researcher begins to look at the data in order to discover incidents and concepts. The essence of open coding amounts to the labelling of these 'concepts' and the eventual sorting of these into categories.

In the initial, open coding phase of the present data analysis, interview transcripts (termed 'cases') were read and codes were applied to different concepts. Initially, these codes were very specific, such as the reasons identified for controlling pesticides: for example, different codes were applied for 'human health', 'environmental protection' and so on. Categories were also identified and developed as codes emerged, for example, 'purpose of controlling pesticides', 'problems with pesticides control' and 'activities carried out by PCB'. These categories represented an 'umbrella' under which codes relating to the same phenomena could be grouped. Some latent codes developed as the analysis progressed, for example 'respondent's attitude towards regs [regulations]'. More than one code could be, and was, applied to the same data. For example, a number of different codes relating to the perceived purpose of regulating pesticides could be applied. It is important to realise that coding at this early stage does not represent a final decision regarding the meaning of data — codes were applied and reapplied and categories rearranged as analysis progressed. Textual data was

---

[374] See Chapter 2. For detailed presentation of the various coding procedures see Strauss and Corbin, 1998, op cit. See also Goulding, 1998, op cit.
[375] Goulding, 1998, op cit., p.54.

compared from case-to-case (interview-to-interview) in order to achieve more consistent coding and to ascertain differences or similarities between cases, and within categories and concepts.

This coding procedure does not enable the researcher to identify the more abstract themes and conditions in the data. It does, however, enable the researcher to move towards that goal by forcing him/her to become immersed in the data and to begin to identify similarities and differences between cases and concepts. This enables the researcher to begin to consider the dimensions of the identified concepts, for example, 'Why does this occur?', 'What does it relate to?', 'Who identifies this?' and so on.

4.2.1.3 Axial coding

The purpose of axial coding is "*to begin the process of reassembling data that were fractured during open coding*"[377]. The emphasis in axial coding is on coding for explanation and understanding of the data, in light of the already identified concepts and categories, and on identifying conditions related to that data, for example, sets of events that influence the identified concepts. The objective in doing this is to look for answers to questions about the data at a more abstract level than in open coding and to develop and consider initial hypotheses.

The main process of axial coding was applied in the present case through the use of memos and using the constant comparative method. Initially, coded sections of text were re-read and similarities, differences or other issues of interest were noted. At this stage, ideas were developed regarding possible relevant conceptual themes, for example, why particular problems might be occurring, differences of opinion according to stakeholder type, why these might occur and the reasons for, and effect of, particular points of view. To explore these conceptual themes further the original texts in every case were reread, using memos but rereading the transcripts in full rather than simply reviewing coded segments. Notes about these ideas were made for each case. On each occasion, the researcher compared the

---

[376] Strauss and Corbin, 1998, op cit., p.101.

current case with those that had already been reviewed in order to facilitate theory development. At the end of this process the researcher had developed several more abstract theories and identified some initial relational statements that seemed to have emerged from the data. These were ideas that explained and described the data at a more abstract level, as opposed to the specific level. Table 4.1, below, illustrates how the cases were reviewed and compared and how themes and relationships began to emerge and were developed. Diagrams illustrating possible links between different concepts were also used. These provided a further tool for the representation of ideas and development of analysis.

Table 4.1. Extract of Coding Memo.

12/10/04 General look at responses of stakeholders to develop theory/ideas. 7. PCB Technicians. Case No. 18.
Representative notes that one of the purposes of pesticides control is to reduce intoxication, through education. So the focus is on the role that education plays in reducing improper practices and use of illegal pesticides etc.
Technician considers that PCB may be going too far in terms of the focus on education and needs to start carrying out more enforcement and regulatory action. So it is considered that there needs to be more formal activities—the technician notes that users "tend not to abide by the rules" so enforcement would be used as another way to achieve compliance. This seems to confirm the view that has emerged from many of the other interviews —that though education and training has been key in facilitating good relationships and changes in practice it does not provide enough of an incentive to always achieve ongoing compliance, or does not have sufficient deterrent effect. So education is important but cannot be the only mechanism used to achieve compliance, though without it users are unlikely to be in a position to be able to comply so this must always remain a first point in the program.

[377] Strauss and Corbin, 1998, op cit., p.124.

4.2.1.4 Selective coding

According to Strauss and Corbin, "*selective coding is the process of integrating and refining categories*"[378]. This 'selective coding' stage of data analysis is vital in order to move the analysis from a collection of interpretations and relational statements to a coherent, grounded discussion of the theory that has emerged from the data. After carrying out the analysis procedures described above, a number of main 'themes' had been identified. The parameters of these themes and the relationships between them were explored through the use of memos and diagrams, again constantly comparing both responses and interpretation and analysis notes to understand the dimensions of the issues. These were further developed into tentative 'hypotheses' or 'relational statements', which the researcher felt reflected the key theoretical issues identified from the data. It should be noted that these relational statements, and the original data, had to be reviewed several times in order to develop the interpretations and the emerging theory.

As noted above, though subject to different classifications for descriptive purposes, the stages of analysis cannot be easily separated. However, it was at this stage in the analysis that the content analysis techniques referred to above were most useful and might be said to have formed part of the selective coding process. The relational statements were developed into a content analysis coding scheme and this was used to investigate further the statements and to enable the researcher to approach the data from an alternative perspective. It should be emphasised here that the content analysis scheme, described in more detail below, was distinct from the codes applied through grounded theory analysis.

It is important to note that the use of content analysis was not simply a way of attempting to quantify qualitative data. A low occurrence of a particular code did not, in itself, mean that the code was unimportant in terms of the emergent theory since the interaction of these codes could mean that they were still perceived as relevant and important. However, the use of content analysis provided a further

---

[378] Strauss and Corbin, 1998, op cit., p.143.

way of analysing the data and the interpretations that had been made thus far and in so doing removed some of the element of 'human distortion' whilst enabling the theory to remain grounded in the data. Some statements which were 'translated' into the content analysis codebooks had seemed important, following earlier stages of analysis, but following content analysis, it became clear that they were much less relevant than had been originally perceived. Furthermore, statements and interpretations made by the researcher were sometimes altered or adapted, following exploration and analysis of the data from this alternative perspective. Relationships that hitherto had not been identified were revealed, or else revealed themselves, to be slightly different than previously thought. One reason for this was that, apart from the results of the analysis — in terms of, for example, coding frequencies — some of the content analysis procedures, such as the use of Key Word in Context (KWIC) searches, highlighted the data in new ways. Thus, whereas the researcher may have mistakenly placed too much emphasis on one particular phenomenon, when developed into the coding scheme and viewed this way, the scope or importance of that phenomenon seemed quite different.

4.2.2 Content Analysis

4.2.2.1 Qualitative content analysis

As described above, it was considered appropriate to use content analysis techniques to develop further the data analysis. Content analysis was originally a quantitative method of data analysis and this remains its primary application.[379] Though it has been applied in many areas, content analysis is perhaps best known in relation to the analysis of media and communication studies, for example the analysis of language used by candidates in presidential campaigns and is often applied to the analysis of naturally occurring language. However, the techniques of content analysis can be applied effectively to a very broad range of areas involving the application of pre-defined codes.[380]

---

[379] Neuendorf, Kimberly A, *The Content Analysis Guidebook*, Thousand Oaks, London, New Delhi: Sage Publications, 2002. pp.14–15.

[380] For an overview of the history, development and application of content analysis see Neuendorf, 2002, ibid.

If seeking to design a study based entirely on content analysis, the researcher would have needed to follow research design procedures more commonly identified with quantitative enquiry: a hypotheses would be tested or another deductive approach would be followed; factors to be measured would be pre-determined; random sampling techniques would be used and traditional, usually statistical methods of measuring reliability and validity would be adopted.[381] For the purpose of the present study, this traditional quantitative approach was adapted to suit the research aims and framework. The researcher does not consider that this has 'diluted' the use of content analysis. Research design decisions were made in accordance with the grounded theory approach and that remains the dominant approach of the overall study. Content analysis was used to take the data analysis further and to augment the rigour and 'fit' of the resultant findings and theory.

The sole use of content analysis for data analysis in the present case would have been inappropriate since content analysis provides only descriptive information about the data that has been analysed, in particular, the relationships (in terms of co-occurrence) between different pre-defined codes. The nature of the present study was such that *a priori* codes were not identifiable at the outset of the study and the application of any such codes without the grounded theory analysis would have limited the investigation of the data, potentially leading to important issues and insights being overlooked. However, it was possible to apply content analysis usefully at this later stage of analysis, to investigate and test the tentative hypotheses that had emerged and to develop a greater understanding of the data and interaction of different variables. In fact, this inductive approach to category identification has been identified as valid on several occasions.[382]

---

[381] For further discussion of these requirements see Neuendorf, 2002, ibid.

[382] See Neuendorf, 2002, ibid.; Hseih, Hsui-Fang and Shannon, Sarah E 'Three approaches to qualitative content analysis,' *Qualitative Health Research* vol. 15 no. 9, November 2005, pp.1277–1288; Mayring, Philipp (2000, June). "Qualitative Content Analysis" [28 paragraphs]. *Forum: Qualitative Social Research [on-line Journal], 1(2).* Available at <http://www.qualitative-research.net/fqs-texte/2-00/2-00mayring-e.htm> (03/08/2006)

4.2.2.2 Variables in content analysis

In content analysis aspects of the data to be tested, through the application of the coding scheme, are termed 'variables' In the present study the relational statements identified in the earlier stages of data analysis formed the basis of the coding scheme. The different elements of these statements or hypotheses were identified and thus formed the 'variables' to be tested. (Examples of these variables include 'perception of the role of the PCB', 'identified role of third parties' and 'identified approach [of the PCB] to control'.) The codes to be applied enable the measurement of the variables. For example, the codes associated with the variable 'perception of the role of the PCB' were 'control-based', 'service-based', 'other' or 'none identified'.

Each variable measured must be 'conceptually defined'. This is a "*declaration by the researcher as to exactly what he or she wishes to study*"[383]. For the purposes of the present study, this requirement was met by the stating of aims and objectives of the study and the development of relational statements through qualitative analysis — the dimensions of the variables to be measured had been shaped through the process of identifying them. Each factor of measurement was not, however, stated explicitly, at the outset of the study, since that would have been contrary to the development of grounded theory.

The measurement of variables relating to the 'conceptual definitions' is termed 'operationalization'. It is perhaps in the use of measurement techniques that content analysis diverges most from grounded theory. Whilst grounded theory seeks to 'discover' themes and theory in the data, in content analysis the principles of measurement theory are followed so that it is assumed that there is a 'true' value for each variable in each unit.[384] Of course, in attempting to code units for 'true' measurements there will be a certain margin of error: "*contributing to this inexactness will be things such as coder misinterpretations...coder inattention... coder fatigue... and recording errors*"[385]. Whereas grounded theory acknowledges

---

[383] Neuendorf, 2002, ibid., p.107.
[384] Neuendorf, 2002, ibid., p.111
[385] Neuendorf, 2002, ibid., p.112.

that, whilst objectivity is desirable, it is a matter of fact that data analysis will be affected in some ways by the background of the researcher, in content analysis an objective level of reliability, validity, accuracy and precision are considered necessary.[386]

4.2.2.3 Coding and coding schemes in content analysis

Perhaps the most fundamental aspect of content analysis is the development of a pre-defined 'coding scheme' (presented in a codebook). Codes must be fully developed prior to their application to the data. Kimberly Neuendorf recognises that one method of developing the pre-defined scheme that is essential to content analysis is the use of a 'grounded' or 'emergent' process of variable identification.[387] This involves the researcher immersing herself in the data and qualitatively identifying relevant variables. It can be seen that this was the approach taken in the present case in which variables to be tested through content analysis emerged through grounded theory analysis.

Many of the principles that apply to the development of interviews and survey questions also apply to the development of coding schemes.[388] In particular, Neuendorf identifies the following requisite properties of such a scheme: categories that are exhaustive; categories that are mutually exclusive; and an appropriate level of measurement (for example ordinal or nominal scales).[389] In the present case it is suggested that these criteria have been met through the careful development and revision of the two coding schemes (the codebooks). Usually in content analysis each category or code is assigned a number. This was not so in the present case because the categories were almost exclusively nominal and the use of numbers, therefore, would be arbitrary. Furthermore, the software used (see below), did not require the use of assigned numbers and in fact the application of numbers to the codes would not have made any real contribution to the output, rather, it may have made it more difficult for the reader to interpret the findings.

---

[386] See Neuendorf, 2002, ibid., Chapter 6.
[387] Neuendorf, 2002, ibid., pp.102–104.
[388] Neuendorf, 2002, ibid., p.117.

The use of software to assist with data analysis is discussed in more detail below (section 4.3). However, at this stage, it is important to note that two possibilities exist in terms of the application of codes in content analysis. The first is the approach of automatic computer coding. In this case, after the data has been properly formatted so that it is readable by the particular program in use, the data is automatically 'analysed' (sorted according to 'dictionary' categories). This is achieved through the use of pre-determined or 'standard' coding schemes or 'dictionaries'. Several subject-specific dictionaries exist and may be selected by the researcher for application to a particular project. The majority of these dictionaries have been developed for the purpose of enquiry into naturally occurring language, in accordance with the origins and tradition of content analysis. For example, Linguistic Inquiry and Word Count (LIWC) is a dictionary which counts words and dimensions representing "*linguistic dimensions (e.g. prepositions, articles) and relativity (references to time, space and motion)*"[390].

However, the type of dictionary described above was not appropriate for use in the present study. In the present study the researcher was investigating emergent issues rather than investigating themes through the use of language. No suitable dictionaries existed for the present purposes and the researcher, therefore, adopted the second approach to coding, that of human or manual coding. In accordance with recognised procedures as described above and the principles of grounded theory, the developed coding schemes were based on the identification and classification of concepts which emerged from the data.

The codebooks were revised several times prior to application to attempt to ensure that codes, and the coding instructions, were unambiguous and sufficiently defined. Instructions were given in relation to what the coding unit was (per transcript or per incident), and in what circumstances codes should be applied, as well as explanation and definition of the concepts to be coded and the response options. Ordinarily, for manual coding, these codebooks would be accompanied

---

[389] See Neuendorf, 2002, ibid., Chapter.6
[390] See Neuendorf, 2002, ibid., pp.128–129.

by a coding form on which to record the results. However, this procedure was omitted since the use of software rendered it superfluous.

4.2.2.4 Exploration of results

The results of this phase of analysis were investigated and presented using several common content analysis techniques. These techniques include frequency lists, used to compare coded responses, KWIC, used to review the coded data in the context in which it appears, and co-occurrence matrices, to consider the relationship between the variables being measured. The use of these techniques is illustrated in more detail below (section 4.3.3).

4.3. COMPUTER ASSISTED DATA ANALYSIS

For the present study, data analysis software was used to aid the data analysis process. It is noted that there has been a degree of reluctance across the social sciences, including in law, to engage in the use of computer software to assist with data analysis.[391] This may be changing in light of the increased availability and development of such packages and the increased pervasiveness of computer use generally. Christine Webb notes that in the earlier days of computer assisted data analysis there were hopes that the use of software would help to address critiques of qualitative research as lacking rigour by providing a more "objective and systematic" approach.[392] Subsequently, however, there has been increased recognition of the fact that the use of software is beneficial only to the extent that it can increase efficiency of data analysis tasks, it cannot alter the inherent nature of qualitative analysis. Although, as noted, some programs do enable 'automatic' analysis of the data (in quantitative approaches, usually through the use of pre-

---

[391] See Morison, Moya and Moir, Jim. 'The role of computer software in the analysis of qualitative data; efficient clerk, research assistant or Trojan horse?', *Journal of Advanced Nursing*, vol. 28 no. 1, 1998, pp.106–116; Kelle, U., 'Theory Building in Qualitative Research and Computer Programs for the Management of Textual Data', *Sociological Research Online* vol. 2 no. 2, 2002 <http://www.socresonline.org.uk/2/2/1.html> (03/08/2006)

[392] Webb, Christine, 'Analysing qualitative data: computerized and other approaches', *Journal of Advanced Nursing*, vol. 29 no.2, 1999, pp.323–330. p.324.

existing 'dictionaries' rather than manual coding), generally, the software is intended to make the analysis process more efficient and perhaps more thorough, while still requiring the constant involvement of the researcher.[393] Particularly for the grounded theory phase of analysis, this latter approach was the only practical choice since the researcher must become immersed in the data and must play an interpretative role in the analysis process.

4.3.1 Issues in computer assisted data analysis

As noted above, the use of software packages is not designed to remove the need for the researcher, and in particular for qualitative studies, for the interpretation of data, but rather to achieve analysis more effectively by (a) increasing the speed of some analysis tasks through the use of automated or semi-automated tasks and (b) by allowing the researcher to view and review the data in different ways in order to help the researcher to build theory, in the case of grounded theory, or realise results in other appropriate ways. This is achieved through the use of various techniques, such as 'search and retrieve' tools, data comparison tools and graphical and modelling tools, all of which should enable the researcher to explore the data in a more efficient way and from different perspectives. Modern software tools enable tasks traditionally carried out manually, such as the highlighting, rearranging and searching of data in hard copy, to be carried out and stored electronically. Old versions of data analysis can be backed up for future reference whilst the evolving theory and analysis can be constantly updated with relative ease.[394]

In adopting a particular piece of software, it is important for the researcher to consider what it is that he or she wishes to report about the data, following the

---

[393] Morison and Moir, 1998, op cit.; Kelle, 2002, op cit.; Webb, 1999, op cit.

[394] For discussion of the scope and functions of software for data analysis see Alexa, Melina and Zuell, Cornelia, 'Text Analysis Software: Commonalities, Differences and Limitations: The Results of a Review', *Quality and Quantity*, vol. 34, 2000, pp.299–321; Lee, Raymond M. and Esterhuizen, Lea, 'Computer software and qualitative analysis: trends, issues and resources', *International Journal of Social Research Methodology'*, vol. 3 no.3, 2000, pp.231–243 and Kelle, 2002, op cit. However, since developments in software for data analysis have been relatively frequent the reader should bare in mind that specific descriptions of software applications may be outdated.

analysis.[395] Kelle also notes the need to take into account methodological prerequisites when utilising software to assist with data analysis.[396] Thus, in pursuing the grounded theory approach to analysis the use of a package based solely on the use of pre-defined codes and quantitative analysis would have been unsuitable.

A criticism of the use of computer software for data analysis is that it distances the researcher from his or her data.[397] Moya Morison and Jim Moir, commenting on their own experience of using the NUD.IST package for the purpose of grounded theory analysis, note that "*using a computer undoubtedly saves time, but it is not clear if this adds to the analysis or detracts from it by distancing the researcher from the data through the mediation of computer software*"[398]. Webb, however, considers that since codes may be "referential" as well as "factual", the act of coding in this context forms part of the interpretation task since the codes themselves are influenced by theory and by the influence of the researcher.[399] Webb's comments were more applicable in the present case and the issue of 'distancing' was not found to be a problem. It is submitted that the features of modern software, particularly the near universal adoption of graphical user interfaces (GUIs), 'search-and-retrieve' tools and 'drag-and-drop' tools, mean that the researcher is no longer separated from his or her analysis — the data, codes and application of those codes are commonly available to see on-screen and the availability of the tools identified above means that it is actually easier to navigate and to explore the data electronically rather than manually.

Another concern is that the researcher should not become 'distracted' by the available software tools but should proceed to analyse the data carefully and sensitively. Webb discusses the possible problems of 'obsessive coding' and

---

[395] Lee and Esterhuizen note the need also to consider the familiarity of the researcher with computers, the availability of resources, the kinds of analysis to be carried out and the nature of the data to be analysed, (Lee and Esterhuizen, 2000, op cit., p.239
[396] Kelle, 2002, op cit.
[397] For discussion of these criticisms see Webb, 1999, op cit. and Lee and Esterhuizen, 2000, op cit.
[398] Morison and Moir, 1998, op cit., p.115
[399] Webb, 1999, op cit., p.325.

reiterates that coding should not become an 'end in itself'[400]. A further, related, concern is the need for the researcher to retain reflexivity in pursuing computer assisted data analysis by avoiding a too-rigid approach.[401] In the present case, the issue of being distanced from the data was not considered to be a problem, nor was it considered that the use of software affected the analysis to the detriment of the study. A large number of codes were identified and applied [402] and the process of analysis took some time. However, it is submitted that these are characteristics of qualitative data analysis and not a result of using the software. With respect to reflexivity, the ability to easily merge, delete and move codes using the software meant that the approach to coding was arguably less rigid than if the coding had been done manually. While the identified concerns are certainly considered to be valid it was felt in the present case that the interpretation of data was not inhibited by the use of the software.

An important reason for the adoption of qualitative data analysis software in the present case was that the researcher wanted to increase the 'transparency' of the research process. While the tools provided by these software packages might be substantially equivalent to the cutting, pasting and highlighting methods adopted for manual analysis, the result is quite different. The application of manual data analysis methods would, it appeared, lead to the researcher accumulating vast amounts of paper, index cards and so on. This would pose a difficulty for other researchers who may want to conduct secondary analysis on this data or may wish to review the way that analysis was undertaken, either as a way to check the 'validity' of the findings or because they are interested in the analysis process and methods. The present researcher believed that the adoption of software would substantively remove these difficulties. Using software for analysis purposes would mean that other researchers could, potentially, review not only the findings of research but also the steps that led to those findings. The way that codes had been applied, and notes documenting interpretation decisions, for example, could be reviewed with much greater ease.

---

[400] Webb, 1999, op cit., p.325.
[401] Morison and Moir, 1998, op cit.
[402] Full lists of all codes applied can be seen in Appendix 8

4.3.2 Selection of software

Because a mixed method approach to data analysis was implemented the selected software had to allow for the exploration of data by the researcher pursuant to grounded theory analysis as well as the option of carrying out some of the common content analysis techniques. Ultimately, the selection of data analysis software was a matter of personal preference, but one which was driven by the research and analysis aims. In selecting software for use in the present study the researcher conducted an initial review of software options.[403]

Since the researcher had already identified the broad approach that would be taken to data analysis, there were a number of key functions that were desirable if not essential, in the selected software. The key techniques of grounded theory analysis formed a substantial part of the analysis so it was important that the software could accommodate these. Perhaps the most important of these was the ability to attach codes to the text (and that these codes could overlap). Since these codes would be further sorted into categories as the analysis developed, that capability was also required. The ability to attach notes or 'memos' to data files was also very important for the purpose of allowing analysis decisions, interpretations and theory development to be recorded along with the data.

Further to these requirements, any functions which made the exploration of the data and review of the analysis more efficient or thorough were considered desirable. These included search-and-retrieve tools (for both original data and for assigned codes and variables) and alternative ways of viewing the frequency of codes and the context in which they appeared, (including graphical and tabular outputs). At a later stage in the analysis, content analysis was to be incorporated and the software, therefore, needed to be able to include relevant and common content analysis tools such as KWIC, word and code frequency counts, co-occurrence matrices and possibly statistical measurements.

---

[403] See Lowe, Will. 'Software for Content Analysis — A Review', <http://www.wcfia.harvard.edu/misc/initiative/identity/publications/content_analysis.pdf> (03/08/2006). Though this indicates that the subject is only software for content analysis, qualitative software options are also reviewed.

Two particular packages were reviewed, using free demonstration versions of the software; these were NVivo and QDA Miner. A third package, Atlas.ti was initially considered. All three packages offered similar functions. It is noted that since the researcher's initial investigation, all of these packages have been substantially upgraded and that comments on the features of these packages may have subsequently become outdated.

QDA Miner and Atlas.ti had similar types of user interface but ultimately the researcher preferred QDA Miner in this respect. One minor issue with Atlas.ti was that the list of developed codes was displayed in a separate window, rather than as part of the main screen and therefore could not be viewed whilst browsing text and assigning codes. One good function that Atlas.ti had (also available in NVivo), which QDA Miner did not, was the ability to build 'conceptual representations' of the relationship between codes; in other words the researcher could develop diagrammatic representations of the relationships between themes or codes. In QDA Miner this could only be done automatically based on the frequency of codes and proximity of those codes to each other. QDA Miner would produce 2D or 3D representations of the relationship between all, or selected codes on this basis. Notwithstanding this shortcoming, overall the researcher preferred the user interface of QDA Miner to Atlas.ti and felt that the coding tools better suited the study's requirements. At this stage Atlas.ti was eliminated from further investigation.[404]

In the present case, the QDA Miner software was adopted. One reason for this was that, despite NVivo's popularity, the researcher did not find it to be particularly 'user-friendly'. The terminology used and the way in which data was displayed and functions carried out simply did not suit the researcher who found QDA Miner to be more intuitive and logical. The use of terms such as 'nodes' rather than 'codes' sometimes meant that learning to use the software became unnecessarily

---

[404] It should be noted that in June 2004 an updated version of Atlas.ti was released (version 5.0). This version of the software has been considerably updated and improved. The researcher has not yet used this updated version but it appears that it will now at least match the functionality of QDA Miner and the interface has been vastly improved.

complicated. This was an important factor since it might affect the researcher's ability to use and interact with the selected software. As well as practical difficulties with using the software, this might also introduce or increase the problem of 'distancing', discussed in section 4.3.1, above. A further reason was that QDA Miner incorporated several data exploration tools, including semi-quantitative tools that were not (at the time) provided by NVivo. Specifically, code co-occurrence matrices and KWIC analysis were available as well as other types of output such as tables, charts, and concept maps (as above). This, in particular, meant that QDA Miner was better suited to content analysis than NVivo.

One limitation of the evaluation of the software options was that it was carried out mainly before the 'real' data was collected. Thus, although the researcher had an idea of the analysis functions that she wished to carry out, it was difficult to test properly the full capabilities of the software according to the way in which they would eventually be used.

4.3.3 Data analysis using QDA Miner

As discussed above, the QDA Miner software package was adopted to assist with the data analysis.[405] Textual transcripts were imported into QDA Miner using the 'document conversion wizard'. Each interview transcript then became one 'case' in the working 'project'. The QDA Miner software enabled all of the necessary qualitative data analysis procedures to be carried out electronically and also incorporated quantitative tools that could be utilised for the exploration of the findings of the content analysis.

One of the most important uses of the software was for the assignment of codes to the textual data. In QDA Miner codes can be assigned to the text directly. The application of the code is shown in the right hand pane of the main window (see Figure 4.1, below). The codes can be arranged into categories and this was done in the present case. In the first instance, codes were assigned during the open coding

[405] QDA Miner is published by Provalis Research, see <www.provalisresearch.com> (03/08/2006)

phase of analysis. As the coding proceeded, codes were, on some occasions, reassigned to different categories or merged with other codes. Figure 4.1 illustrates some of these early codes and the way in which they were applied to the text. Information can be assigned to each code, for example, instructions as to when the code should be applied or the scope and parameters of the concept being coded.

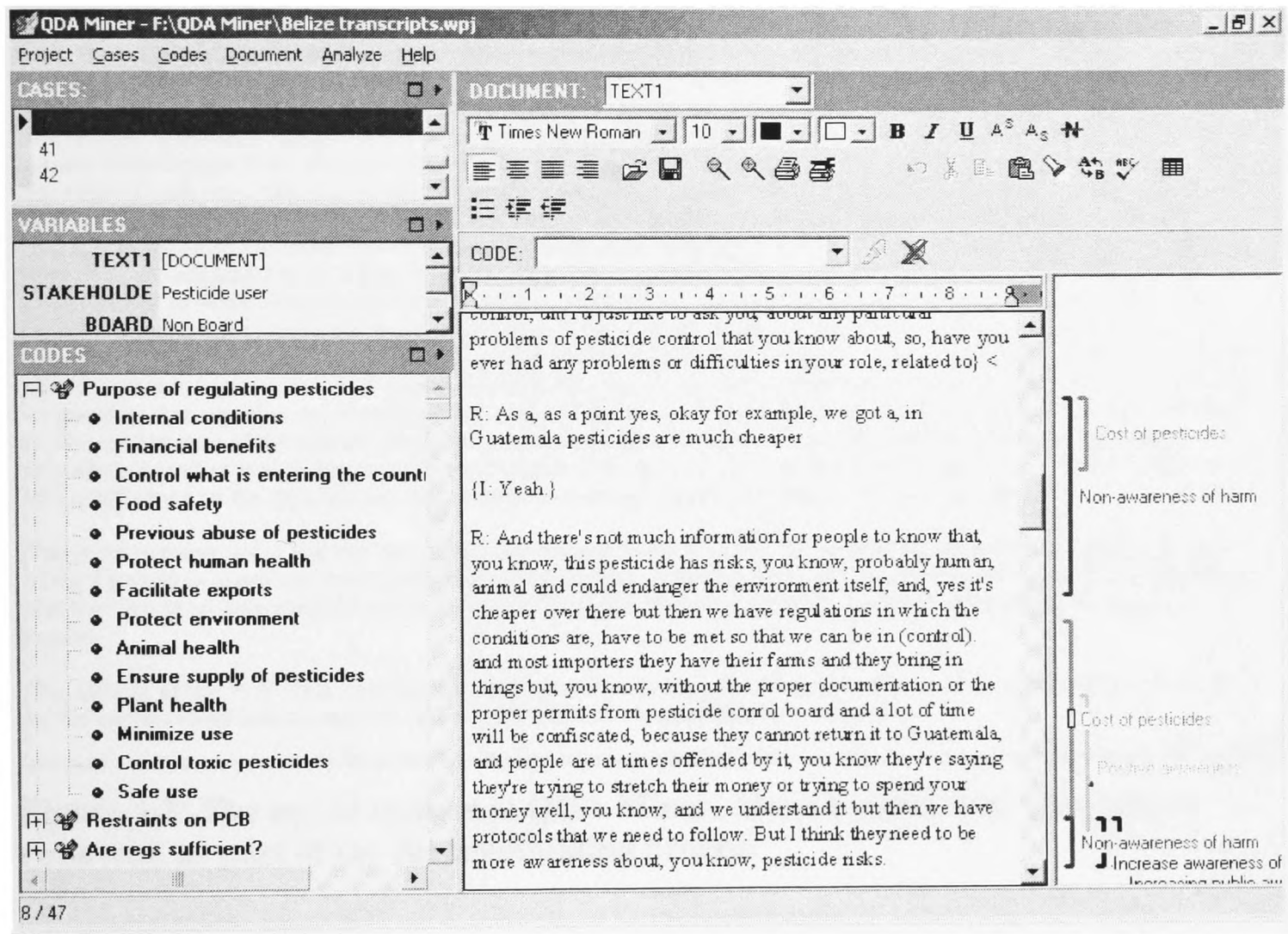


Figure 4.1: The main window in QDA Miner. The coding bar, illustrating developed codes and categories, is displayed in the bottom left hand window. The data (interview transcripts) is displayed in the main, middle window. The application of codes to the data is displayed in the right hand window.

Another important function of the software was the use of notes and memos to record interpretation and analysis decisions, as described above. The memos created were viewed in a separate window, which was stored within the project file but could also be saved as a separate file. This was done during the axial and selective phases of coding so that these memos could be reviewed separately from the original data. Memos could be added through the 'notes' option. Notes could also be attached to the codes applied to data. This was done in some instances when it was felt that a particular comment should be added 'in situ' but usually

interpretations and notes were added as memos. Figure 4.2 illustrates the use of memos in QDA Miner.

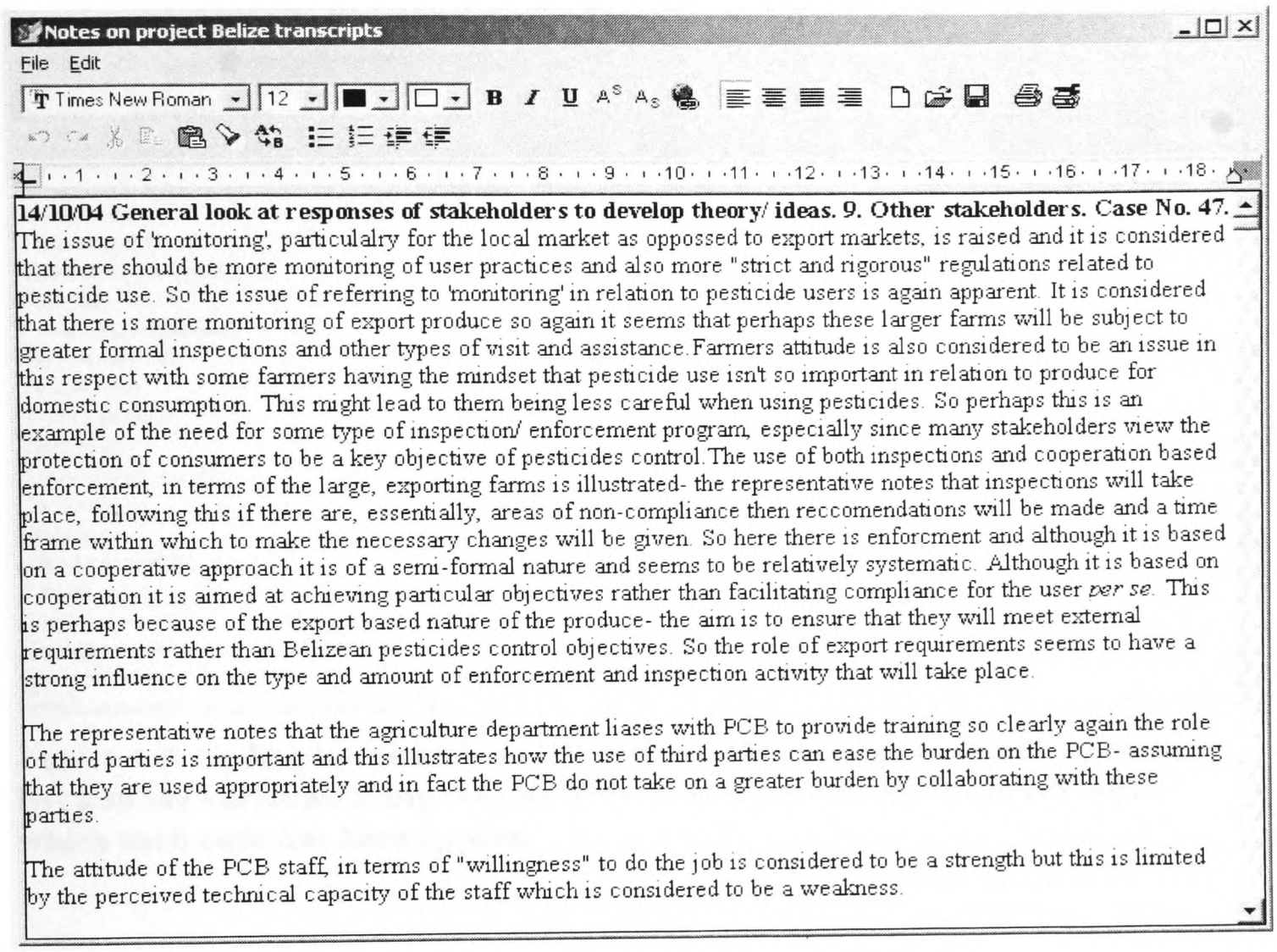
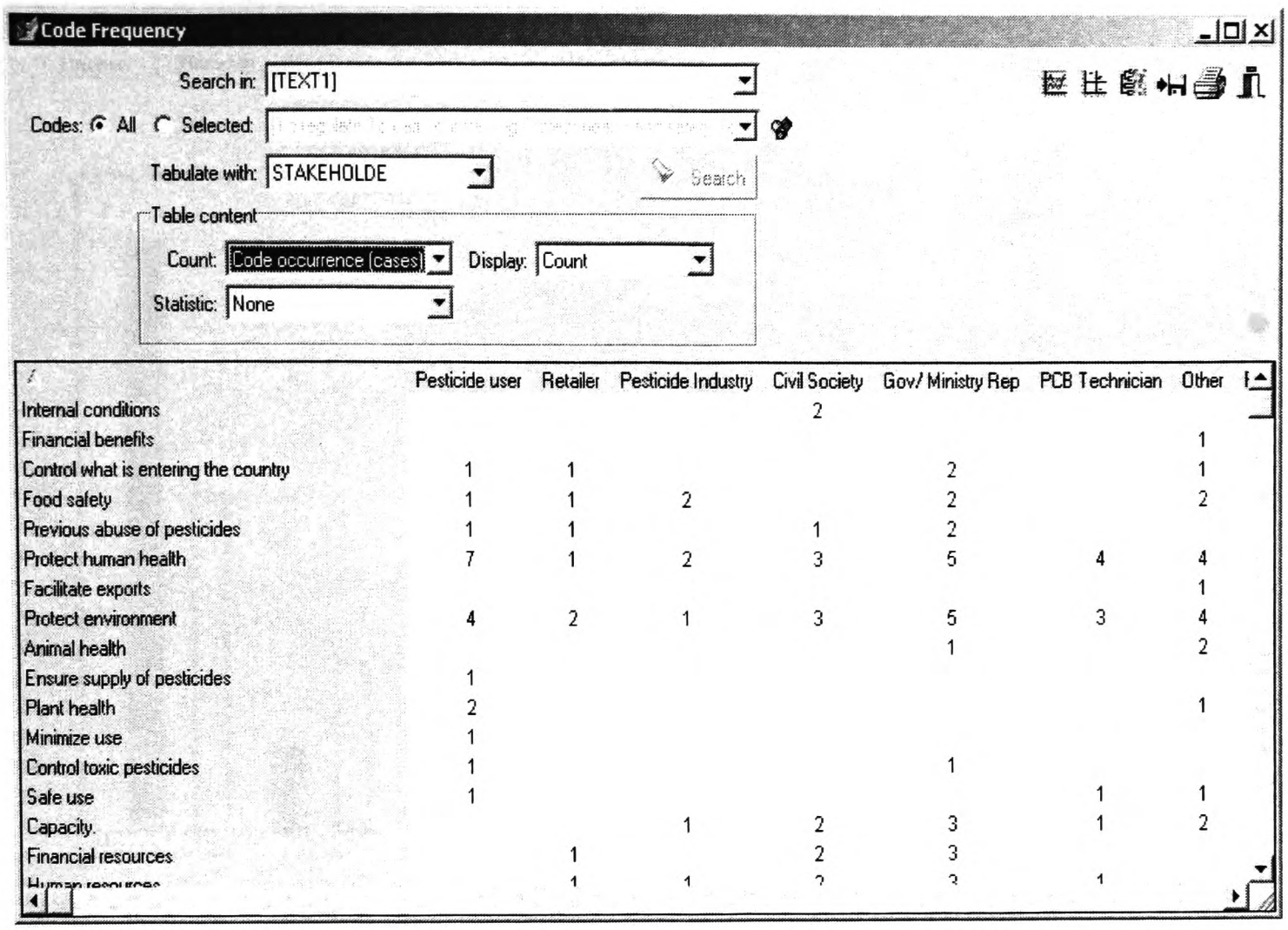


Figure 4.2: The use of memos in QDA Miner. These memos were themselves reviewed, as part of the theory-building process

Variables (as distinguished from those later measured through content analysis) were also assigned to the data. These pertained to stakeholder type and status of Board membership (member or not). In the case of the BAHA study the sector of production with which private sector stakeholders were involved was also a variable. The middle window on the left-hand side of Figure 4.1 demonstrates the attachment of variables to cases. Following initial coding using the coding bar, the assigned codes could be explored by variable. This allowed for exploration into the relationship between particular attitudes and responses according to variable which in turn led to valuable insights. Figure 4.3 demonstrates the use of the 'coding by variable' tool. The results of this analysis could also be presented in graphical form (see Figure 4.4) or exported to MS Excel, as was usually the case.



	Pesticide user	Retailer	Pesticide Industry	Civil Society	Gov/ Ministry Rep	PCB Technician	Other
Internal conditions				2			
Financial benefits							1
Control what is entering the country	1	1			2		1
Food safety	1	1	2		2		2
Previous abuse of pesticides	1	1		1	2		
Protect human health	7	1	2	3	5	4	4
Facilitate exports							1
Protect environment	4	2	1	3	5	3	4
Animal health					1		2
Ensure supply of pesticides	1						
Plant health	2						1
Minimize use	1						
Control toxic pesticides	1				1		
Safe use	1					1	1
Capacity.			1	2	3	1	2
Financial resources		1		2	3		
Human resources		1	1	2	3	1	

Figure 4.3: Coding by variable in QDA Miner. The codes are displayed on the left and the variables along the top. This window shows the frequency with which each code has been applied.

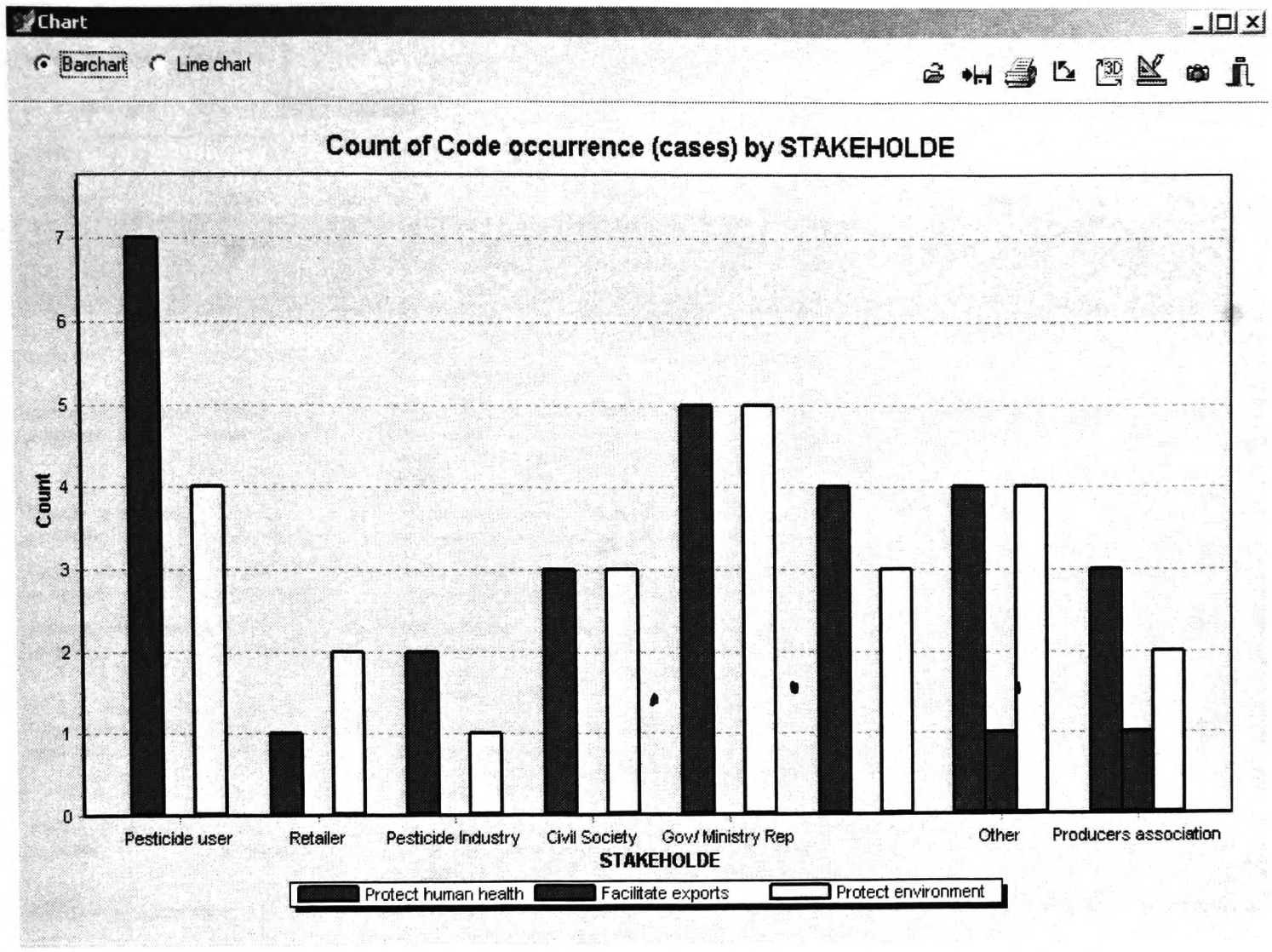
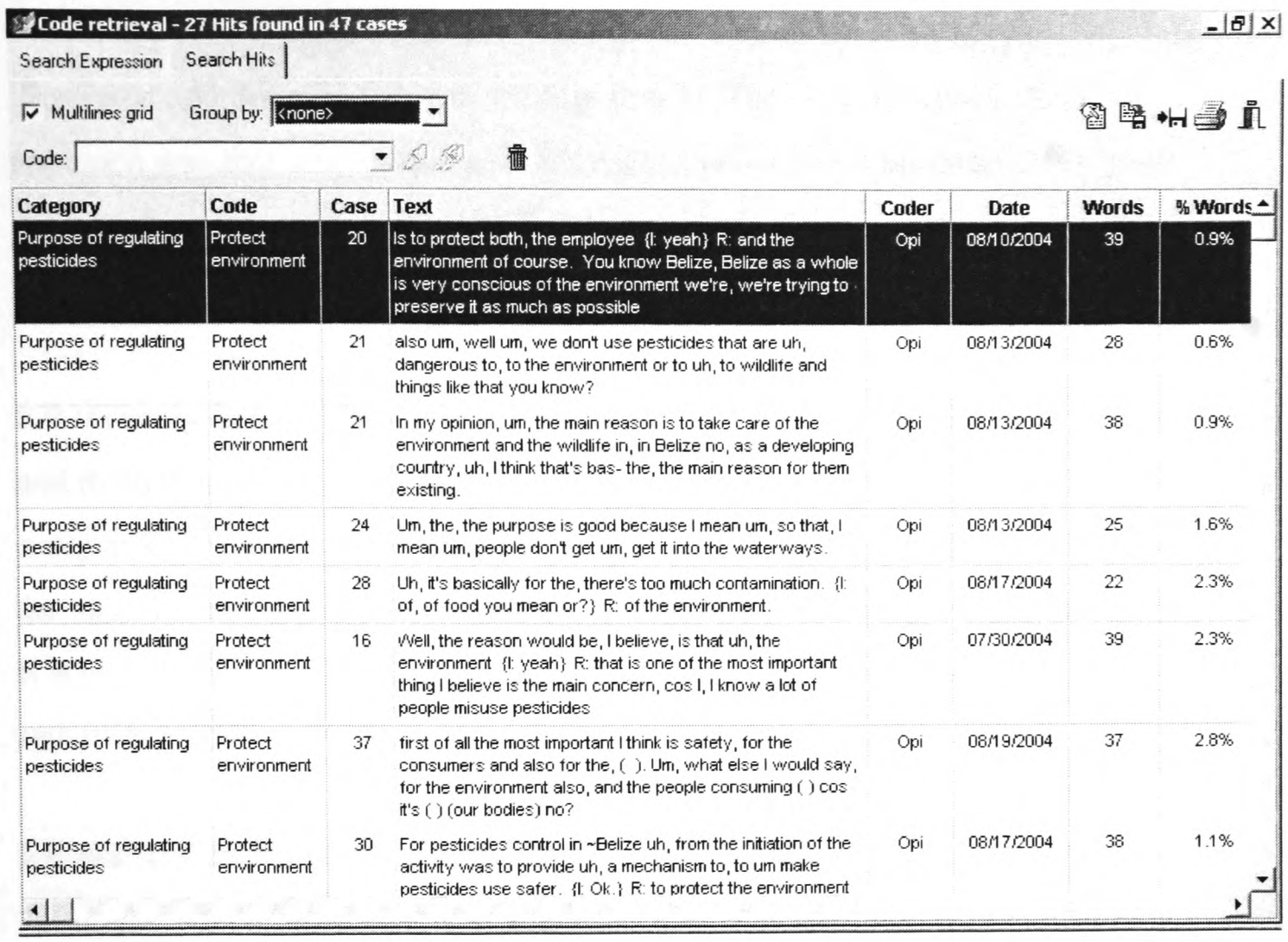


Figure 4.4: Tabular presentation of 'coding by variable' in QDA Miner.

Another useful tool was the 'coding retrieval' tool, which was used to review coded segments of the text: all of the sections of text which had a particular code 'attached' could be retrieved and listed. This was a useful way of ensuring consistency in the application of codes and also for further reviewing the data. The results of the coding retrieval could be coded or re-coded. Other information could also be displayed, for example the associated variables, allowing for further consideration of the data. Figure 4.5 illustrates the use of the 'coding retrieval tool'.



Category	Code	Case	Text	Coder	Date	Words	% Words
Purpose of regulating pesticides	Protect environment	20	Is to protect both, the employee {I: yeah} R: and the environment of course. You know Belize, Belize as a whole is very conscious of the environment we're, we're trying to preserve it as much as possible	Opi	08/10/2004	39	0.9%
Purpose of regulating pesticides	Protect environment	21	also um, well um, we don't use pesticides that are uh, dangerous to, to the environment or to uh, to wildlife and things like that you know?	Opi	08/13/2004	28	0.6%
Purpose of regulating pesticides	Protect environment	21	In my opinion, um, the main reason is to take care of the environment and the wildlife in, in Belize no, as a developing country, uh, I think that's bas- the, the main reason for them existing.	Opi	08/13/2004	38	0.9%
Purpose of regulating pesticides	Protect environment	24	Um, the, the purpose is good because I mean um, so that, I mean um, people don't get um, get it into the waterways.	Opi	08/13/2004	25	1.6%
Purpose of regulating pesticides	Protect environment	28	Uh, it's basically for the, there's too much contamination. {I: of, of food you mean or?} R: of the environment.	Opi	08/17/2004	22	2.3%
Purpose of regulating pesticides	Protect environment	16	Well, the reason would be, I believe, is that uh, the environment {I: yeah} R: that is one of the most important thing I believe is the main concern, cos I, I know a lot of people misuse pesticides	Opi	07/30/2004	39	2.3%
Purpose of regulating pesticides	Protect environment	37	first of all the most important I think is safety, for the consumers and also for the, ( ). Um, what else I would say, for the environment also, and the people consuming ( ) cos it's ( ) (our bodies) no?	Opi	08/19/2004	37	2.8%
Purpose of regulating pesticides	Protect environment	30	For pesticides control in ~Belize uh, from the initiation of the activity was to provide uh, a mechanism to, to um make pesticides use safer. {I: Ok.} R: to protect the environment	Opi	08/17/2004	38	1.1%

Figure 4.5: 'Coding retrieval' in QDA Miner.

Initially, it was intended that the content analysis aspects of the data analysis would be carried out in the separate add-on to QDA Miner, WordStat, which had been purchased for this purpose. When arriving at this stage of analysis the researcher realised that all of the techniques that were needed could in fact be carried out in QDA Miner, though they were not necessarily named and presented as such.

The application of the coding scheme in QDA Miner followed the same format as for the application of codes during the earlier, grounded theory stages of analysis. However, all of the predetermined codes were, of course, added before any coding of the text took place. Coding instructions set out in the codebook (which could also be attached to the codes within QDA Miner) had to be followed. Each of the coded segments could be viewed using the 'coding retrieval' tool and this, therefore, provided a further opportunity to explore the data to which the codes applied and also to check for consistent application of the coding scheme.

Frequency counts could be achieved using the 'coding by variables tool' (as illustrated and described above, see Figure 4.3). The only drawback to this approach was that total frequencies for each code were not produced, though in practice these were rarely needed.[406] Also, since this information could be, and usually was, exported to MS Excel, total frequencies could be produced that way.

KWIC analysis could be produced to some extent using the coding retrieval tool and including the identification of variables in that retrieval. However, the KWIC analysis in WordStat was sometimes more useful because it displayed the text of the case as well as the coding details (see Figure 4.6, below). For this reason, the KWIC function in WordStat was sometimes used to explore specific key words, rather than codes.

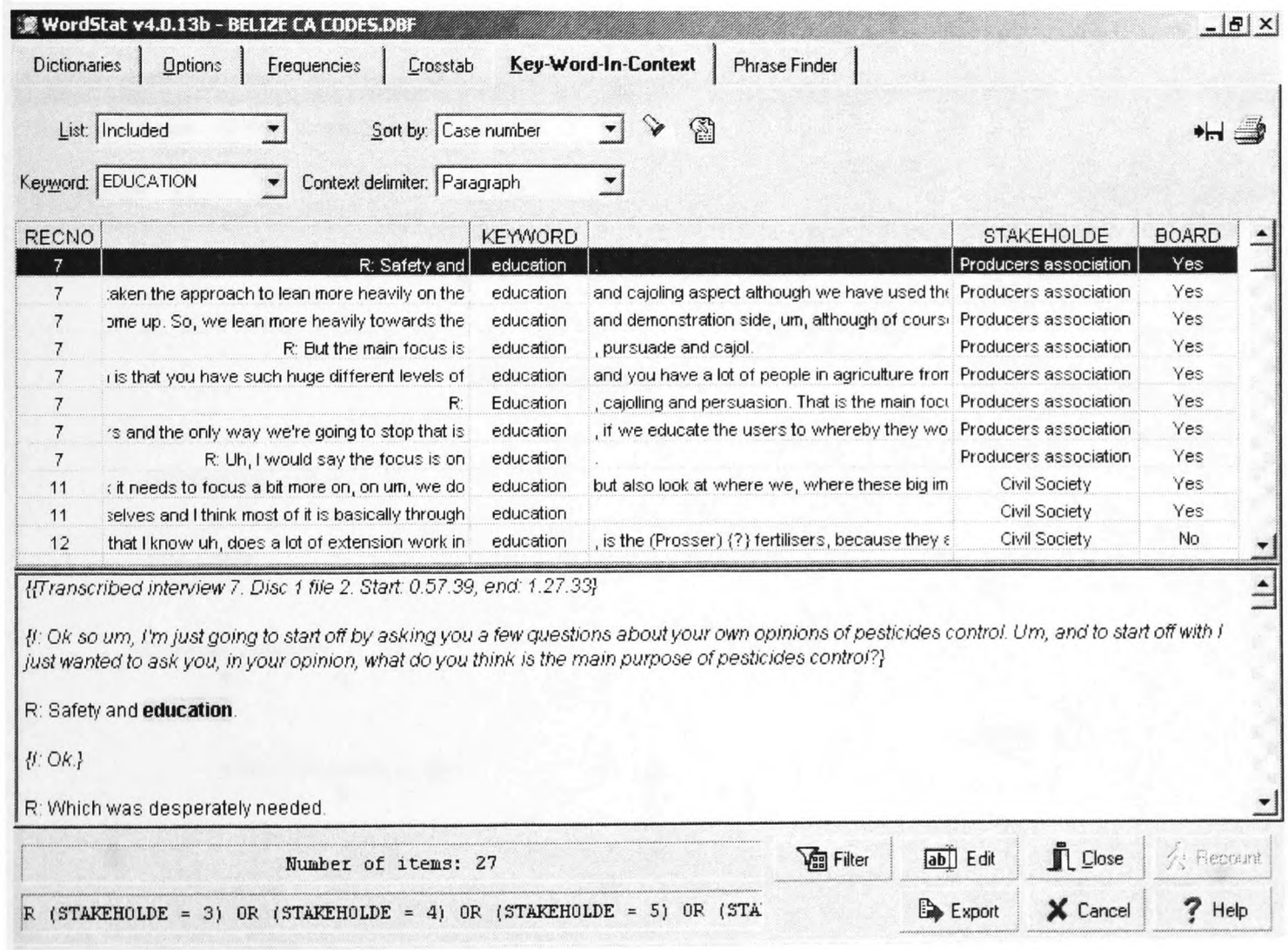


Figure 4.6: 'KWIC' analysis in WordStat.

[406] A subsequent software update added a 'list codes' option which did include total frequency counts.

One of the most useful functions of WordStat was the production of co-occurrence matrices. These could also be produced in QDA Miner and were frequently used to examine the relationship between different codes and variables, as described above. Apart from the simple co-occurrence matrices, other tools for the presentation and review of the relationship between codes were available. Two-dimensional maps demonstrating these relationships could be produced. (See Figure 4.7 which shows the relationship between codes applied under the categories 'role of third parties' and 'type of third party'. The relationship is based on the frequency with which codes co-occur within a case, with the output based on this co-occurrence for the whole dataset). Although these could not be completely reliable in demonstrating the actual significance of relationships, they did provide another way of viewing the data and sometimes enabled the exploration of relationships that had not previously been considered.

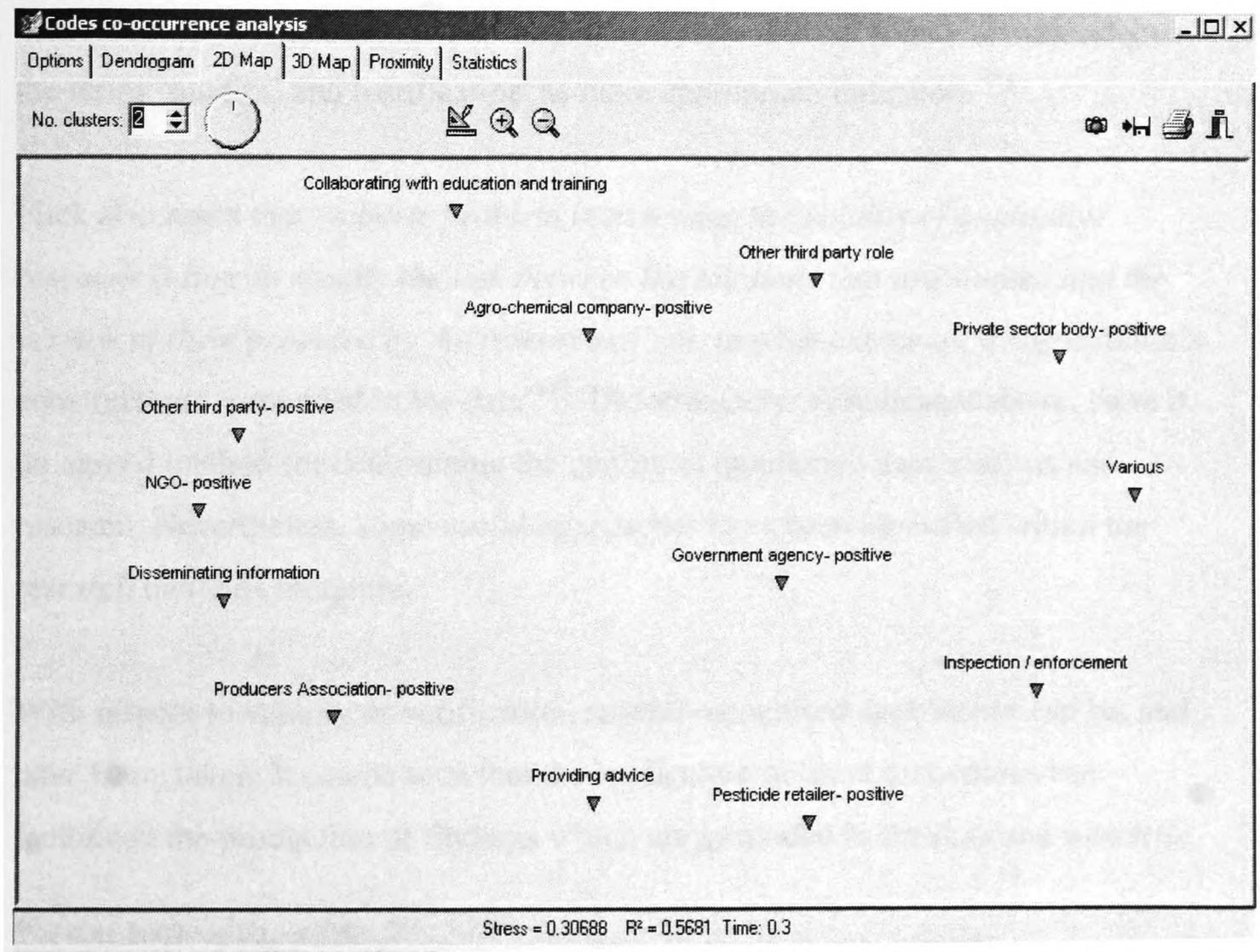


Figure 4.7: A two-dimensional representation of the relationship between codes in QDA Miner. The categories presented are 'role of third parties' and 'type of third party'.

4.4. EVALUATING THE DATA ANALYSIS PROCESS

Uwe Flick notes *that "the problem of how to assess qualitative research has not yet been solved"*[407]. Although this refers to the evaluation of research in overall terms, the problem also applies specifically to the evaluation of qualitative data analysis procedures. Whereas the terms 'validity' and 'reliability' are often used with respect to the evaluation of quantitative data, these terms may not be appropriate for the evaluation of qualitative data or must be 'reformulated' so that they are appropriate.[408] In this context 'validity' is seen as a measure of the extent to which findings can be generalised and therefore represent the "truth"[409]. Reliability refers to the replicability of the data; the extent to which the application of the same procedures will yield the same results.[410] The aim of measuring reliability and validity is, therefore, to measure (and ensure) the 'quality' of the findings and the methods of achieving this must be, it is often argued, different for qualitative as compared with quantitative research. Indeed, John Creswell adopts the terms 'quality' and 'verification' as more appropriate indicators.[411]

Flick also notes that "*a basic problem in assessing the validity of qualitative research is how to specify the link between the relations that are studied and the version of them provided by the researcher*", or, to what extent are the researcher's constructions 'grounded in the data'[412]. Unfortunately, as indicated above, there is no agreed method for determining the quality of qualitative data analysis and research. Nevertheless, some useful approaches have been identified within the research methods literature.

With respect to validity or verification, several recognised approaches can be, and have been, taken. It can be seen that the application of these procedures has facilitated the production of findings which are grounded in the data and which do,

---

[407] Flick, 2002, op cit., p.218.
[408] See Flick, 2002, ibid.
[409] Silverman defines validity as an expression of 'truth'. See Silverman, 2000, op cit., p.175.
[410] Neuendorf, 2002, op cit., p.141. See also Silverman, 2000, op cit.
[411] See Creswell, John W, *Qualitative enquiry and research design: choosing among five traditions*, Thousand Oaks, London, New Delhi: Sage Publications, 1998. Chapter 10.
[412] Flick, 2002, op cit., p.222.

it is argued, reflect the perceptions that were in fact held by interviewed stakeholders. One of the most important of these, central to grounded theory, is the constant comparative method. The application of the constant comparative method in the present study has been illustrated in earlier sections. It is suggested that this was an important procedure in ensuring that categories and codes were properly formed and that there was consistency in the application of these codes and in the interpretations made.

The comprehensiveness of the data analysis sample has also been identified as important with respect to validity. The need to analyse those cases which do not conform to the emerging theory has been recognised as providing an important check on the interpretations and inferences made by the researcher, therefore ensuring that the findings or conclusions reflect more accurately the limits of those interpretations and the variation occurring within the data.[413] Creswell also discusses the need for 'comprehensive data treatment', that is, the inclusion of all cases, rather than a sample. Again the purpose of this is ensuring that the full variation in data is explored so that the findings will more closely reflect the 'truth'[414]. It can be seen that in the present case this identified need was met since all interview transcripts were analysed. Not all of the resulting findings were presented — codes which ultimately did not contribute to the overall theory or which did not provide any insight into the issues (as identified by the researcher) were not presented. However, the findings that are presented also reflect the variability of the data — the breakdown of responses is given so that the reader can see those cases in which a particular code might only have been applied once or where the perceptions of a particular stakeholder group diverged from other groups. Finally, in presenting the further analysis and discussion the researcher sought to discuss those cases in which findings or stakeholder perceptions differed from the prevalent view and to discuss the possible reasons for this.

---

[413] See Silverman, 2002, op cit., who refers to this as 'deviant case analysis'. Flick, 2002, op cit., who refers to the same process as 'analytic induction' and Creswell, 1998, op cit. who refers to the process as 'negative case analysis'. See also Strauss and Corbin, 1998, op cit., p.159, who also suggest validating the theory by comparing it with the 'raw data'. This was done in the present case.

[414] Silverman, 2002, op cit.

Triangulation of data analysis methods was adopted and this also served to increase validity.[415] As has been discussed, the adoption of the mixed-method approach aimed to introduce an element of objectivity into the analysis procedures and provided an alternative way of analysing the data and of questioning the researcher's interpretations and hypotheses. It has been demonstrated above that the use of content analysis as well as grounded theory analysis was useful because this did enable alternative insights and on some occasions led to the researcher identifying new issues of importance or ultimately to reinterpreting the data. This also accords with the 'refutability principle' identified by David Silverman, who suggests that the researcher should seek to refute assumed relationships.[416] However, although the content analysis codebooks were designed to enable codes to be applied as objectively as possible, it is recognised that the researcher will have had some influence in this respect. This is firstly because, as described above, the researcher's background and experience will have some influence on the design of the codebook, for instance, on how particular themes are investigated. Secondly, the researcher both designed and applied the codebook and therefore any subjective influences would have been continued to the application of the codes. It is recognised that improved validity could have been achieved by using more than one coder for the purpose of content analysis (see below).

The researcher also suggests that triangulation of the presentation of findings can be a way to avoid the 'anecdotalism' and 'selective plausabilization' which may particularly arise where the only source of data presented is quotations from the transcripts (or equivalent source).[417] It can be seen (in the following chapters) that in the present case this type of triangulation was employed and that data is presented in the form of charts and tables as well as through direct quotations.

With respect to 'reliability', it is recognised that this concept is unlikely to be useful for evaluating qualitative data where it is applied within the same parameters of quantitative data. The same application of the data collection

---

[415] Triangulation is discussed as process to increase validity by Silverman, 2002, ibid. and Creswell, 1998, op cit. Flick, 2002, op cit. discusses triangulation with respect to 'generalisation'.
[416] Silverman, 2002, op cit.

methods, even to the same stakeholders, might not yield the exact same findings. This is the nature of qualitative research; the findings are influenced at every stage not only by the presence of the researcher but also by the involvement of other participants whose perceptions will change over time according to various experiences including those which might not obviously be related to the area of research.[418] The procedures that were adopted to ensure consistency of data collection have been discussed in the previous chapter.

In terms of the data analysis procedures, it is recognised that reliability in this respect was limited by having the researcher alone undertake the analysis. Having more than one coder would have enabled reliability to be tested by measuring inter-coder reliability and improved by relying on more than one person's analysis and interpretation of the data. This was, in fact, attempted. The researcher enlisted the help of an undergraduate student to code a sample of the transcripts. As for all aspects of the study, however, the time available to train the coder was limited. After some training and review of progress, it was considered by both the researcher and the potential coder that the extent of background knowledge needed to enable the data to be interpreted effectively and analysed (apart from understanding the methodology and coding procedures) was too great to enable effective coding within the time available. For example, the assistant coder would need a considerable knowledge of the numerous legislative provisions, of who various stakeholders were and of the general cultural background. It is suggested that since the use of a predetermined content analysis dictionary was neither available nor appropriate to the study, the only way that other coders could have been successfully involved with the analysis was if they had been involved *ab initio* with the design and implementation of the study as a whole and had participated in the fieldwork. Clearly such a project was beyond the means and scope of the present doctoral study.

It is argued, however, that the application of the software assisted in improving reliability. As discussed in the previous section, the use of data analysis software

---

[417] See Flick, 2002, op cit., p.218.

does, at least potentially, provide increased transparency of the data analysis process and an improved opportunity for other researchers to investigate the extent to which the findings presented reflect, in their opinion, the issues arising in the data and the codes that have been assigned to that data. This recognises that in analysing the data the researcher will have made certain decisions concerning the meaning of the data (what the interviewee said) and how this will be coded. Other researchers or observers could potentially view the data analysis files and see exactly how the text was coded. This should make it easier for other researchers to see where and why inferences were made (compared with instances in which that information is not available or is present in various forms of manual analysis such as index cards containing hand-written notes). This in turn provides an opportunity for a type of peer-review and for other researchers to access both the primary data and the analysis of that data.

Although it is recognised that the terms 'validity' and 'reliability' are not necessarily useful for evaluating qualitative data analysis, these terms are usually used with reference to content analysis. For this reason, the extent to which these objectives are addressed in the present application of content analysis should be considered.

One measure of validity is the extent to which the sample is representative of the population it represents.[419] Whereas the overall study was not intended to be statistically representative (of the population of Belize or even of the relevant sample population for Biosecurity), it is possible to argue that since one hundred percent of the collected data was analysed, using content analysis procedures (as well as grounded theory procedures), generalisations may be made to the whole of the collected data. The concept of 'face validity' is similar to that of 'fit' in grounded theory analysis, that is, taking a step-back from the findings, do they appear to fit the data and do the measurements used seem appropriate to the concepts to which they are applied.[420] As was the case in the present study, the

---

[418] This is recognised, for example, by Flick, 2002, op cit., p.220.
[419] See Neuendorf, 2002, op cit., p.115.
[420] Neuendorf, 2002, ibid.

researcher must take a step back from the data and consider whether their findings appear to reflect what is going on in the data. Several other measures of validity are discussed in relation to content analysis but these were not considered to be appropriate measures for evaluation of the present study since they are primarily intended to be used in wholly quantitative studies.

Full reporting of all procedures is desirable in content analysis in order to achieve 'replicability'[421]. In the present case, the researcher attempted to achieve this primarily through the production of a codebook, which contains detailed coding instructions, and through the use of software which enables other researchers to access memos and notes associated with the data and data analysis.

Whilst grounded theory is primarily a qualitative methodology, that is not to say that in pursuing grounded theory the researcher cannot, or should not, introduce quantitative aspects of data collection and/or analysis in cases in which this will assist the overall study. The hypothetico-deductive origins of quantitative data collection and analysis may appear to be at odds with the primarily inductive approach of grounded theory, nevertheless, as Strauss and Corbin recognise, the "*aim of theorizing is to develop useful theories. So, any technology, whether qualitative or quantitative, is only a means for accomplishing that aim*"[422]. Overall, the mixed-method approach adopted for data analysis helped to improve the 'validity' and 'reliability' or 'quality' of the findings. The approach was found to be beneficial in allowing the researcher to consider the data in different and useful ways and to develop theory that is grounded in the data.

The benefits of computer assisted data analysis were the comparative ease with which the researcher was able to edit, analyse and explore the data. In the present case, it is submitted that the use of data analysis software undoubtedly enabled a more thorough and efficient investigation of the data than would have been achieved through manual analysis. One of the drawbacks in adopting data analysis software was the time taken to learn how to use it, though this did not pose a

[421] Neuendorf, 2002, ibid.

substantial difficulty and it is considered that overall the analysis would not have been completed more quickly if manual analysis had been undertaken. A further issue was that it was very difficult to picture in advance how the software would be used. The scope of the functions available and the benefits and limitations of this only really became apparent when the software was used with the 'real' data, as opposed to the use of demonstration versions or tutorials. As discussed above, some misunderstandings in relation to the use of QDA Miner (or more specifically the WordStat add-on) arose despite the prior identification of the procedures that were likely to be carried out and the review of the software prior to selection. However, these minor drawbacks did not negate the significant benefits of adopting the software. The researcher was happy with the choice of software and found that all desired analysis processes and techniques could be applied.

[422] Strauss and Corbin, 1998, op cit., p.27.

Chapter 5: The Pesticides Control Framework, Belize — Findings and Analysis

In this chapter the findings of the PCB study are presented. In part one coded responses derived from both grounded theory and content analysis are presented.[423] In the second part of the chapter these findings are analysed further and their broader implications discussed. This second part is divided into five sections: (i) the regulatory approach of the PCB; (ii) the approach to, and extent of, enforcement; (iii) the role of the legislative framework and legal mechanisms in implementation and in achieving compliance; (iv) the role of third parties in the implementation and enforcement of the pesticides control framework and (v) the role and composition of the Board of Directors. A brief summary of the key findings, in terms of identified strengths and weaknesses is given in part three. Finally, in part four, issues arising from this first phase of fieldwork, as a pilot study, are examined.

5. 1 FINDINGS AND ANALYSIS OF CODED RESPONSES

It will be remembered that the aim of the study of the pesticides control framework was to consider the extent to which it has been successful by identifying strengths and weaknesses of the framework based on stakeholder perceptions and experiences. The study was undertaken within the broader aim of identifying successful approaches to and problems and challenges for national Biosecurity regulation and to consider how these might be relevant to other developing countries seeking to implement Biosecurity frameworks (see Chapter 2).

The findings presented indicate stakeholder perceptions, experiences and opinions of the pesticides control framework, as identified, analysed and interpreted by the researcher, following the data analysis procedures already described in Chapter 4. This first part of the chapter presents the initial results of coding. For example, stakeholder attitudes, such as coded positive and negative perceptions of the PCB and opinions of the pesticides control legislation are presented as are identified characteristics of the PCB such as the regulatory approach and approach to

[423] The codebook providing coding instructions for the content analysis can be seen in Appendix 6.

enforcement. Broader analysis and discussion of the findings are presented in part two.

Figures 5.1 – 5.3 show coded responses indicating stakeholder perceptions of the overall regulatory approach of the PCB. Figure 5.2 presents the findings by stakeholder type. (The breakdown of the full sample by stakeholder type can be seen in Chapter 3, Table 3.1.)

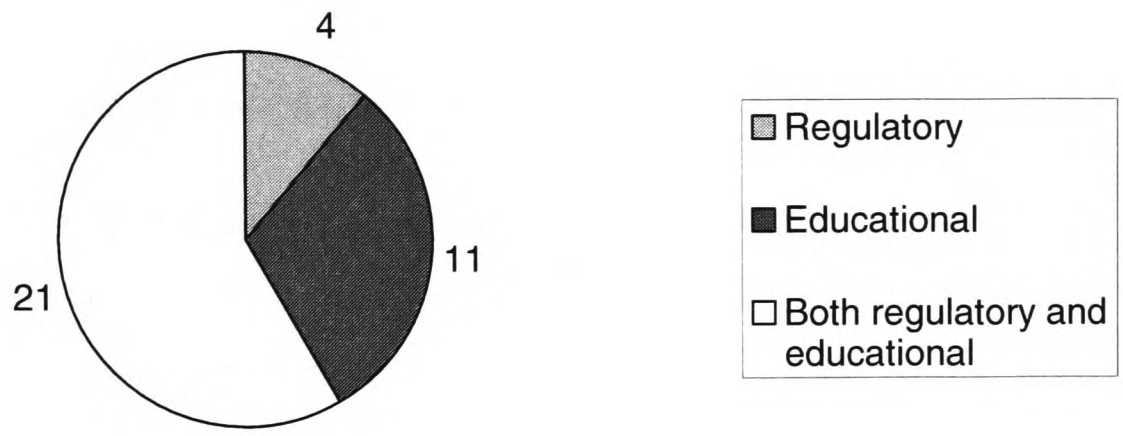


Figure 5.1: Approach to controls (overall totals)

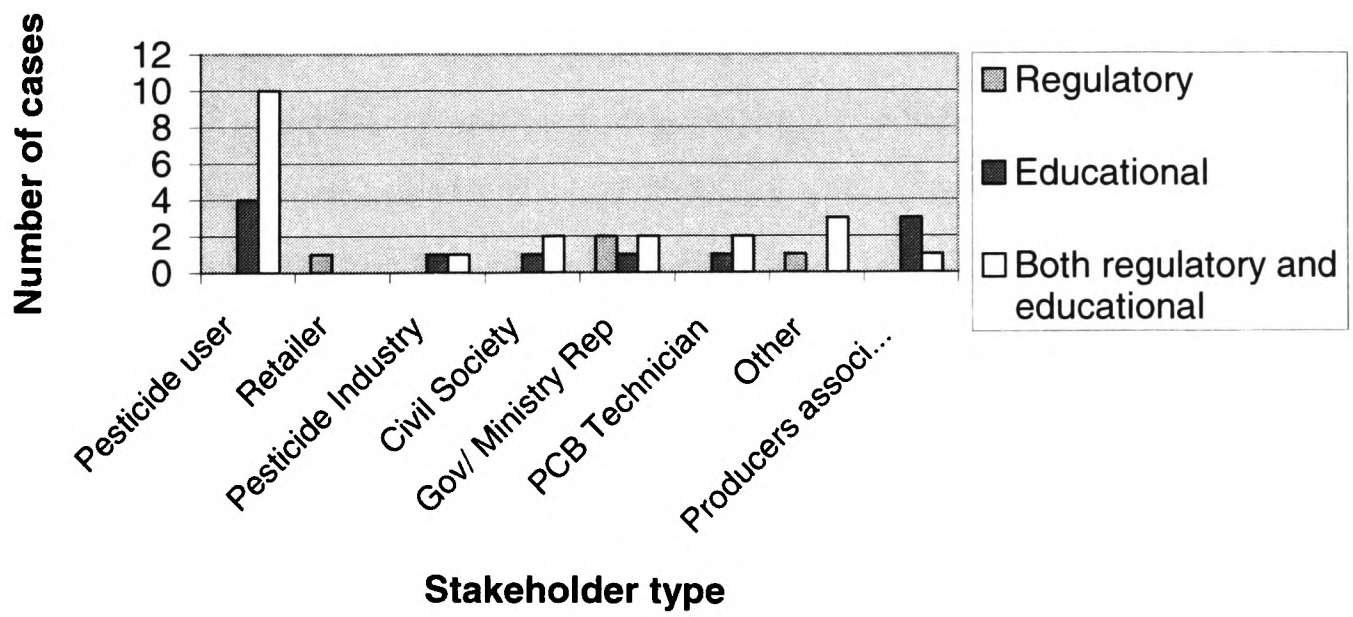


Figure 5.2: Approach to control (by stakeholder type)

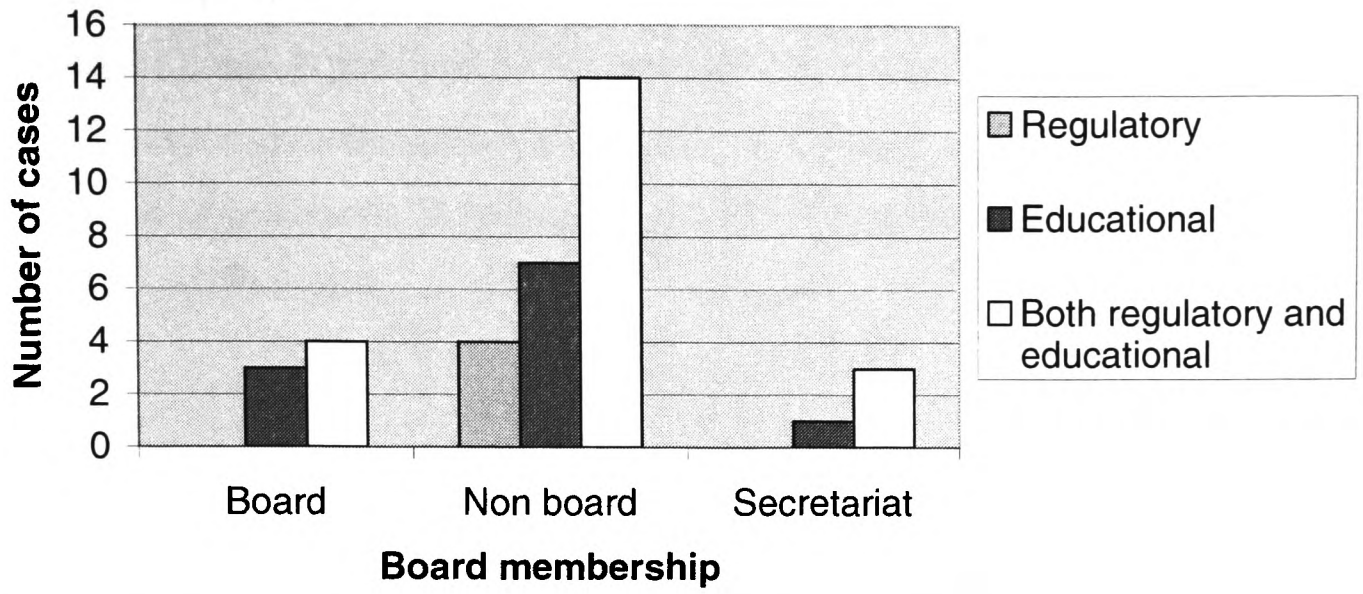


Figure 5.3: Approach to control (by Board membership status)

The approach of the PCB towards pesticides control, as identified through stakeholder interview responses, was coded as either regulatory, educational or both regulatory and educational (see PCB codebook, Appendix 6). Overall, only a minority of interviewees viewed the PCB's approach to pesticides control as primarily regulatory. Many — almost one-third — of the interviewees for whom a response was coded viewed the PCB's approach as being primarily educational. The majority of interviewees (58% of those for whom a response was coded) viewed the approach as both regulatory and educational. There is some variation between stakeholder types: pesticide retailers, government and ministry representatives and 'other' stakeholders were the only stakeholders to identify the PCB as having a regulatory approach to pesticides control. Generally, the coded responses of the remaining stakeholder types were a mixture of 'education' and of 'both educational and regulatory' approaches. It can be seen from Figure 5.3 above that at the Board level, all categories of interviewee primarily identify a mixed approach to control ('both regulatory and educational'). The division is smallest for Board members for whom an educational approach is identified in three of the seven cases and a mixed approach is identified by four of the seven cases.

Responses indicating a mixed approach to control were split in terms of the regulatory and educational aspects identified. An educational approach was almost always identified in terms of the PCB providing assistance, including training and

education, to pesticide users. A regulatory approach was identified primarily in terms of the controls provided by the certified user licence system (identified in 10 of the 21 responses coded as both regulatory and educational) and control of the importation of pesticides, including registration of pesticides, (identified in seven of the 21 responses coded as both regulatory and educational).

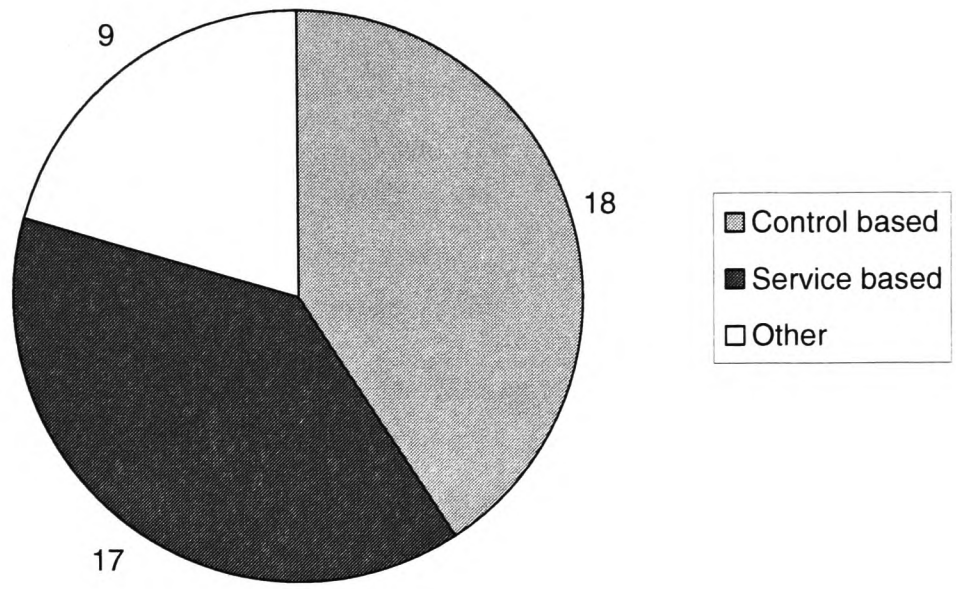


Figure 5.4: Perceptions of the PCB (overall totals)

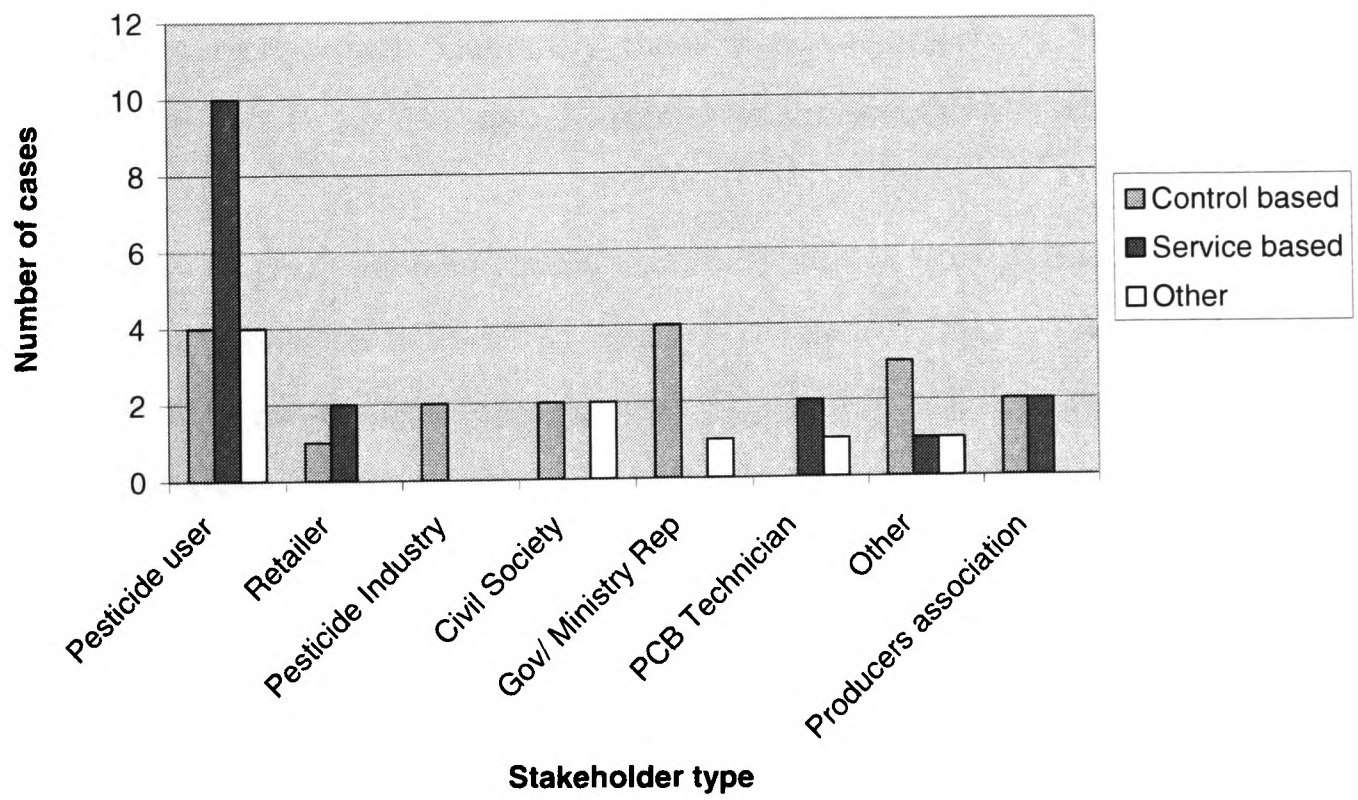


Figure 5.5: Perceptions of the PCB (by stakeholder type)

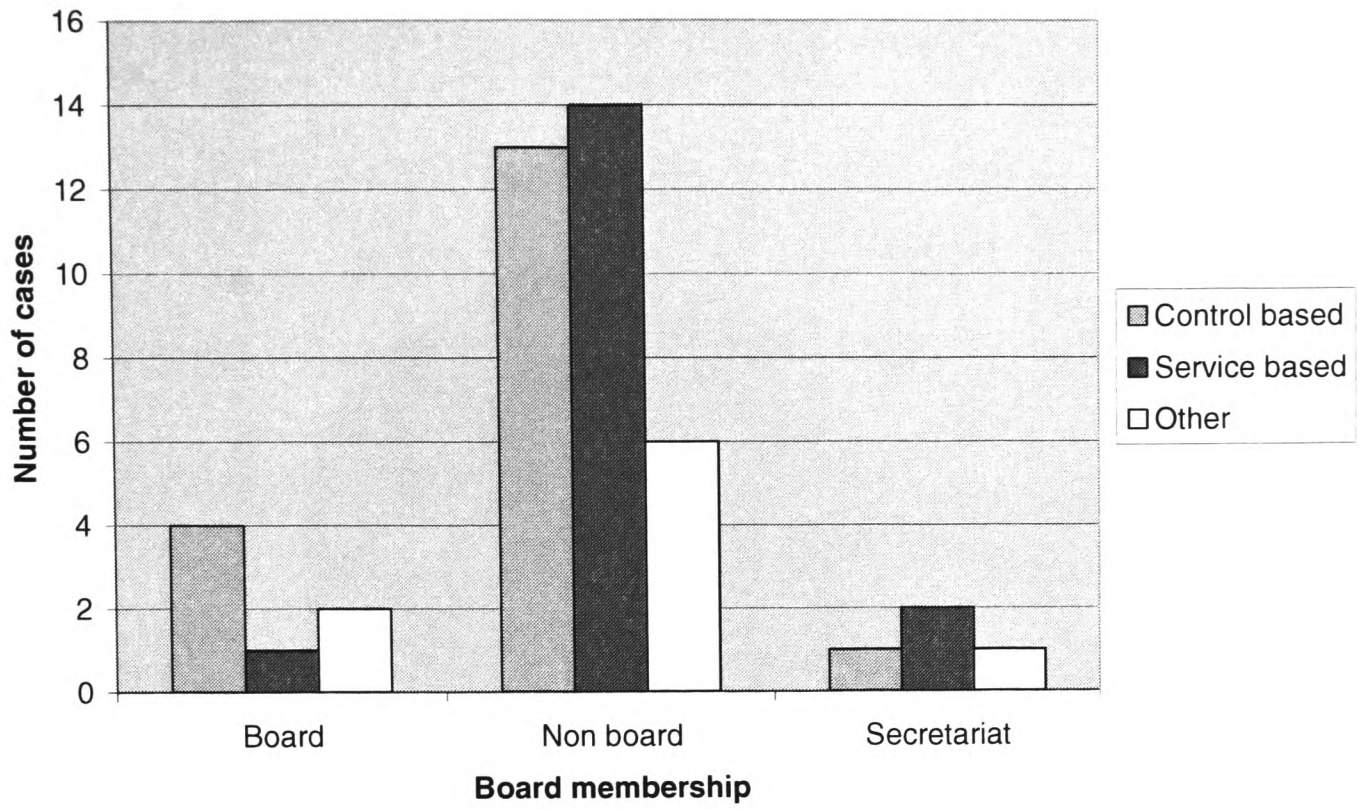


Figure 5.6: Perceptions of the PCB (by Board membership status)

Perceptions of the PCB were mixed. In 41% of cases for which a perception of the PCB was coded, that perception was of the PCB as a control-based agency. Thirty-nine percent of the coded responses identified the PCB as a service-based agency. Twenty percent of the coded responses indicated the perception 'other'. 'Other' responses indicated a mixed perception of the PCB (including control- and service-based aspects) or a perception that did not pertain to either a control-based or service-based approach. Generally, these responses referred to the overall function of the PCB, for example, its role in environmental protection.

The majority of pesticide users perceived the PCB as a service-based agency. This response was identified in 10 of the 18 cases of pesticide users. The service-based perception was also the dominant perception amongst PCB technicians and pesticide retailers. Other stakeholder types more frequently identified the PCB as being a control-based agency.

In terms of Board membership, it can be seen that Board members most frequently identified the PCB as a control-based agency. Non-board members and the Secretariat more commonly identified the PCB as a service-based agency, though

division of responses amongst these categories was minimal, particularly for the Secretariat.

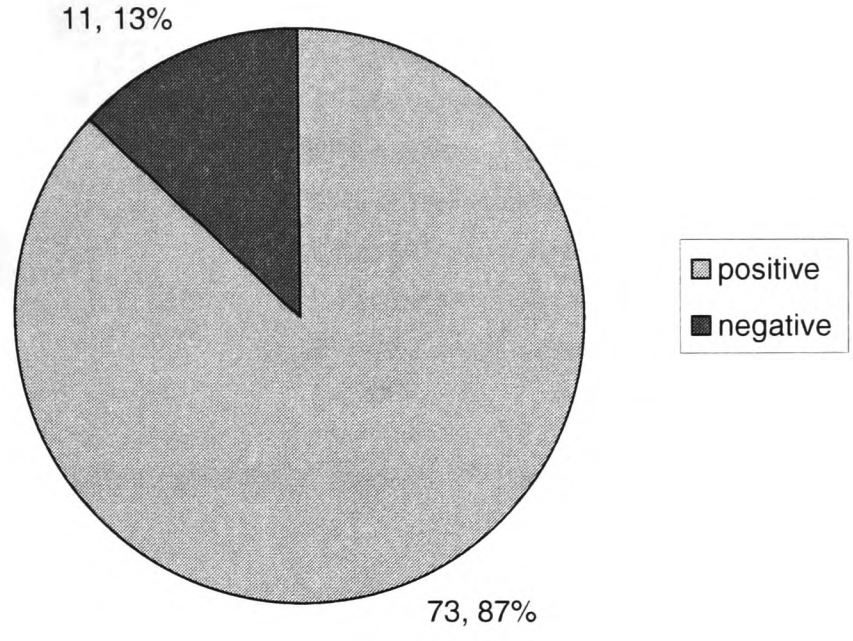


Figure 5.7: Positive and negative perceptions of the PCB (total code frequencies and percentage value)

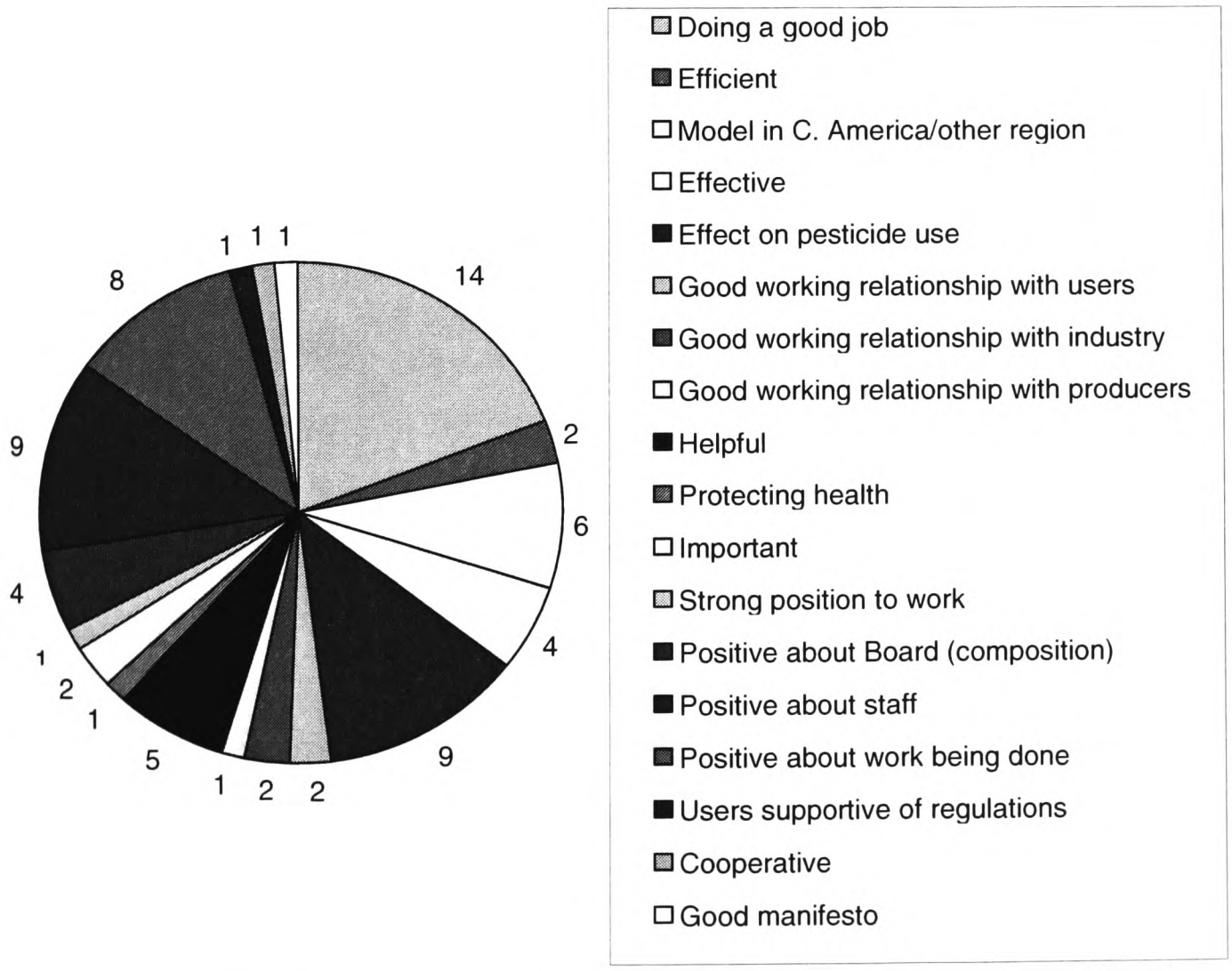


Figure 5.8: Positive perceptions of the PCB (overall totals)

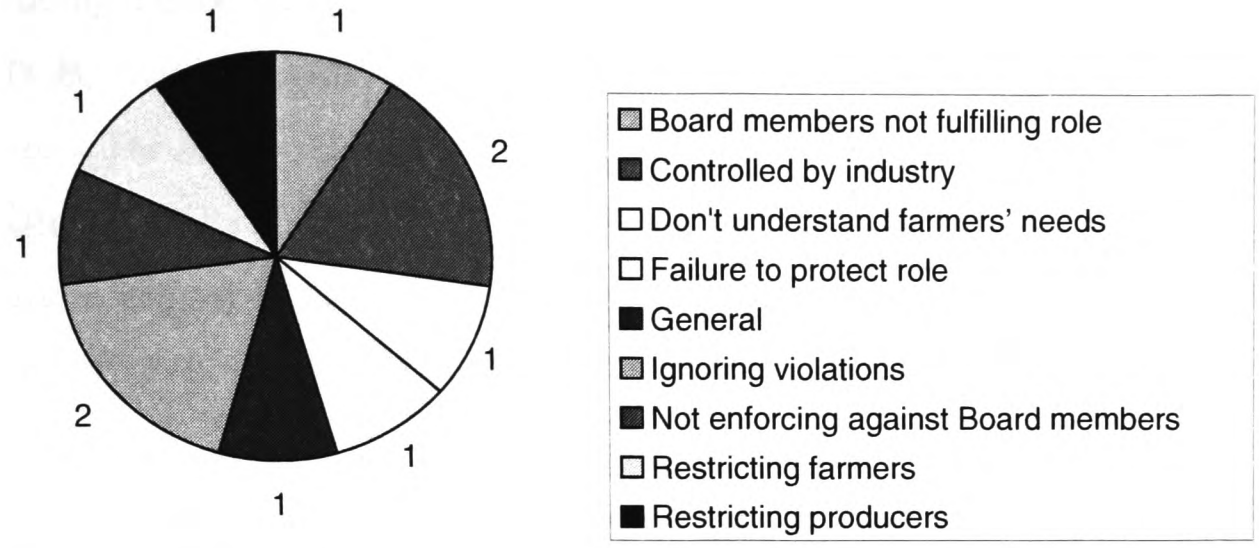


Figure 5.9: Negative perceptions of the PCB (overall totals)

Figures 5.7–5.9 show positive and negative perceptions of the PCB, coded through grounded theory analysis. Figure 5.7 highlights the overall frequencies of positive and negative perceptions according to the total frequency of codes applied (rather than case frequencies). Figures 5.8 and 5.9 indicate the number of cases in which each response type occurred. (It should be remembered that, because in grounded theory analysis more than one code can be applied from any given category to the same text, more than one different positive and negative perception could be coded per case.) The majority of coded responses indicate positive perceptions of the PCB. It can be seen that of all those responses coded 87% were positive.

Negative perceptions relate to specific issues (Figure 5.9) with each issue being identified by one or two interviewees. Negative perceptions relate to the integrity of the PCB in terms of it effectively implementing and enforcing pesticides control (for example, 'not enforcing against Board members', coded in one case and 'ignoring violations', coded in two cases) and also relate to the effect of pesticides control on the regulated community including the regulatory burden on producers, for example 'restricting farmers' and 'restricting producers' (each coded in one case). Two interviewees considered the PCB to be 'controlled by industry', the industry in question being the pesticides industry.

The most common positive perception was a general feeling that the PCB is 'doing a good job'. Other common positive perceptions relate to the staff of the PCB, most frequently in relation to the attitude and capability of the Secretariat staff. The responses 'helpful' and 'co-operative' also relate to the perceived attitude of the Secretariat. The work being carried out and the impact of that work accounted for further positive responses, for example, support for the activities being carried out by the PCB, including the extent to which these have been carried out, and the impact of that work to date on pesticides use in Belize. The response 'strong position to work' relates to a lack of government or other interference with the work of the PCB. It can be seen that a number of these positive perceptions, or similar issues, are also identified as strengths of the PCB (Figure 5.11).

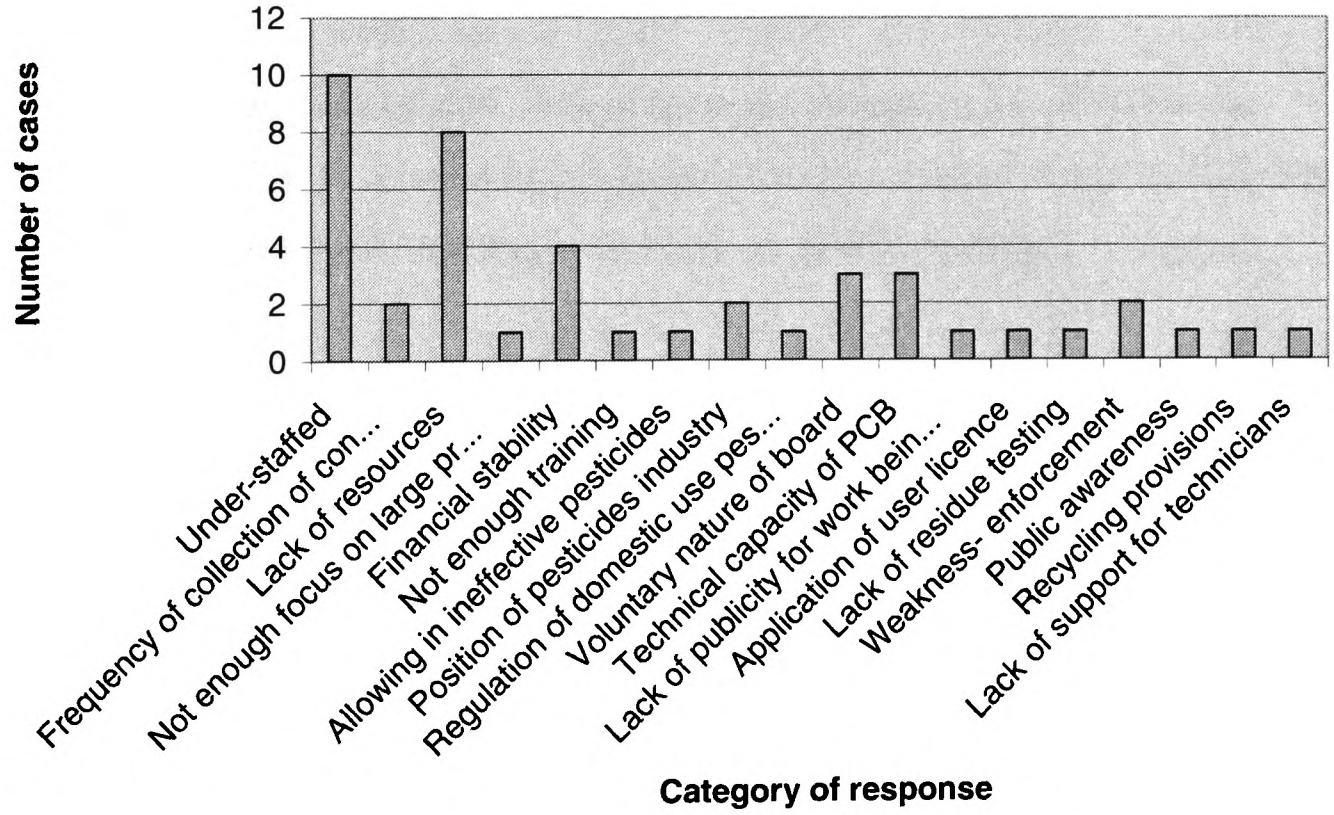


Figure 5.10: Perceived weaknesses of the PCB (overall totals)

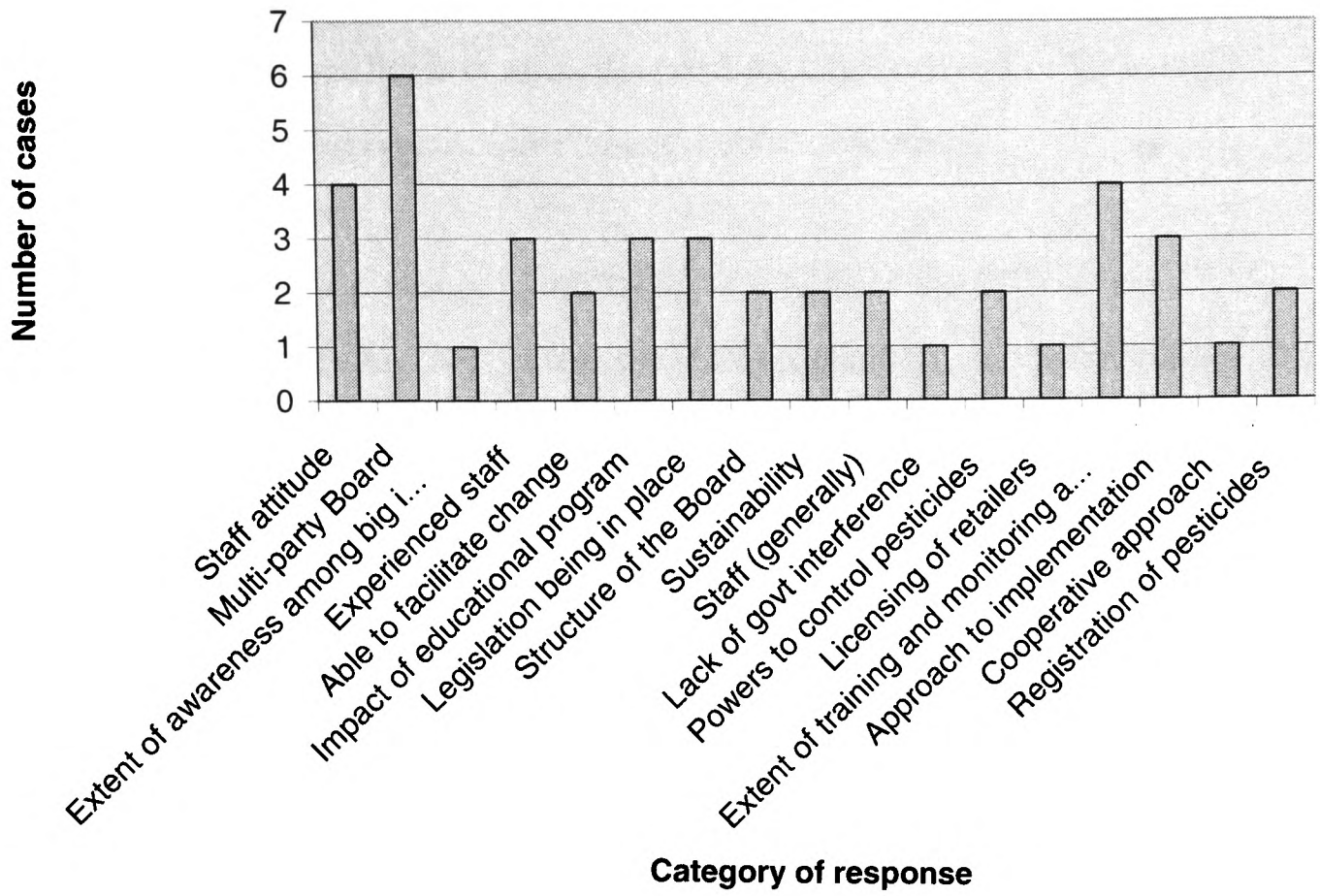


Figure 5.11: Perceived strengths of the PCB (overall totals)

Half of the identified weaknesses (Figure 5.10) relate directly to the availability of resources including lack of staff, lack of [general] resources and the financial stability of the PCB. In relation to this latter issue the financial sustainability of the PCB was a concern. Sustainability was, however, also a perceived strength in some cases.

Some 'internal' issues were identified. The technical capacity of the PCB, including technicians, was a concern for some stakeholders in this respect (coded in three cases), particularly in light of the increasing specialisation of pesticide products and introduction of new products. The voluntary nature of the Board, in the context of the capacity of Board members to devote time to the work of the PCB, was also a concern (coded in three cases) and in one case a lack of support for technicians (from the Board of Directors) was considered to be a weakness. The position of the agro-chemical industry representatives as Board members was considered to be a weakness in two cases. This was in terms of the role of the industry in decision-making and difficulty of regulating the industry (the two major agro-chemical companies) as Board members. Other specific issues, also identified relatively infrequently, generally pertain to the application of particular

areas of pesticide control and the extent to which the PCB carries out particular activities such as the collection of confiscated pesticides from border control points as well as enforcement, training and public awareness.

The two areas most commonly identified as strengths of the PCB (Figure 5.11) relate to the Board of Directors and to the staff (particularly the technicians). The multi-party composition of the Board was the most commonly identified strength and the structure of the Board, in terms of the existence of the different sub-committees, was also identified positively. A relatively high number of coded responses relate to the Secretariat. Interviewees considered the attitude of the staff towards the work, particularly the perceived willingness of staff to do the job and their commitment to it, and the experience and capability of the technicians and the Registrar, to be strengths. The existence of the legislation and powers of the PCB were also identified strengths.

Other identified strengths were the extent and impact of work done, including awareness of the regulations amongst importers, the impact of the educational programme (including training) and the carrying out of specific activities. The approach of the PCB towards implementation and the co-operative approach generally were also identified as strengths.

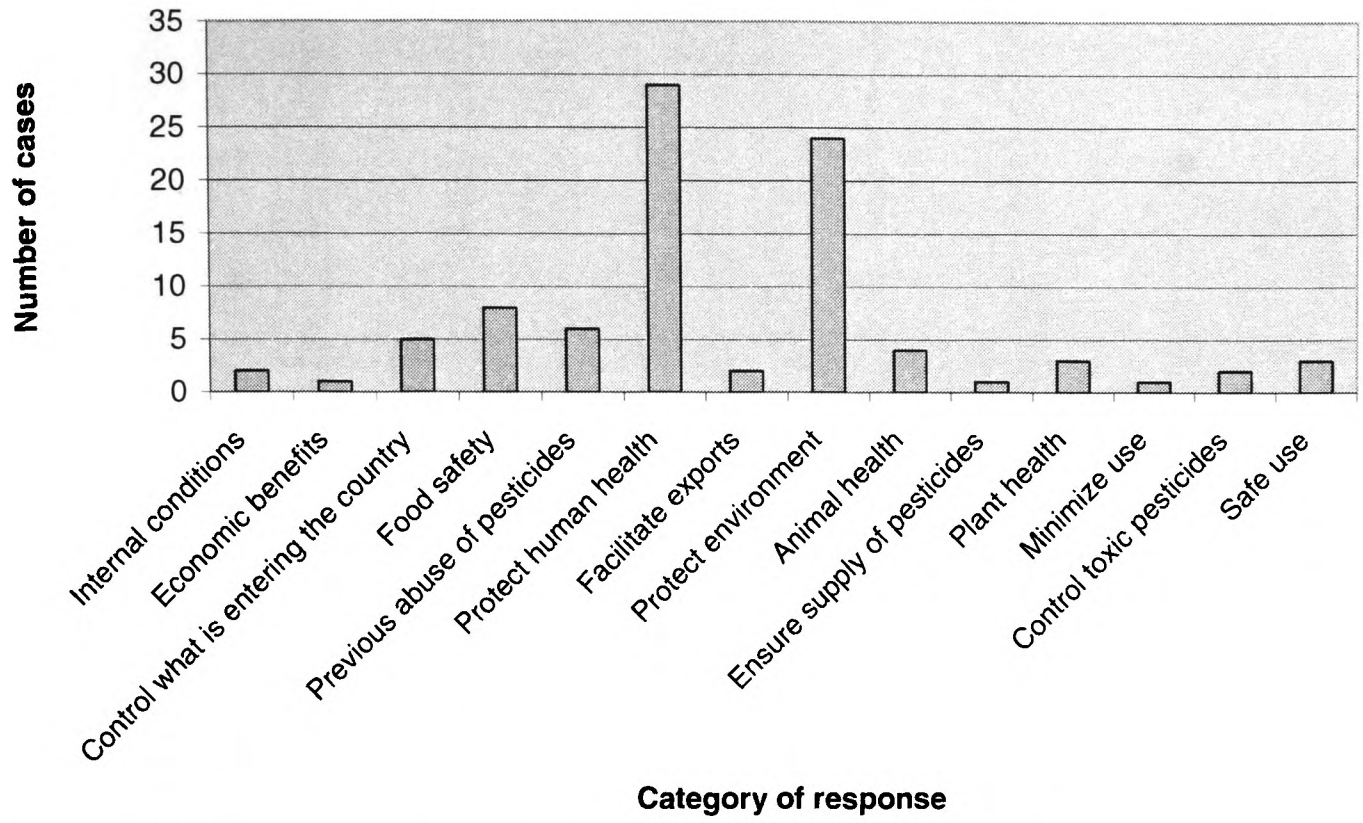


Figure 5.12: Purposes of regulating pesticides (overall totals)

Figure 5.12 presents responses, coded through grounded theory analysis, of the perceived purposes of regulating pesticides. Generally, stakeholder awareness of the purpose of controlling pesticides was high. The majority of stakeholders identified reasons for the control of pesticides which were consistent with those officially recognised by the PCB. Sixty-two percent of all interviewees considered the protection of human health to be a purpose of pesticides control. Fifty-one percent of all interviewees considered environmental protection to be a purpose of pesticide control. Other responses related to various other relevant health and safety objectives. One interviewee also considered that the purpose was to achieve economic benefits through more effective use of pesticides.

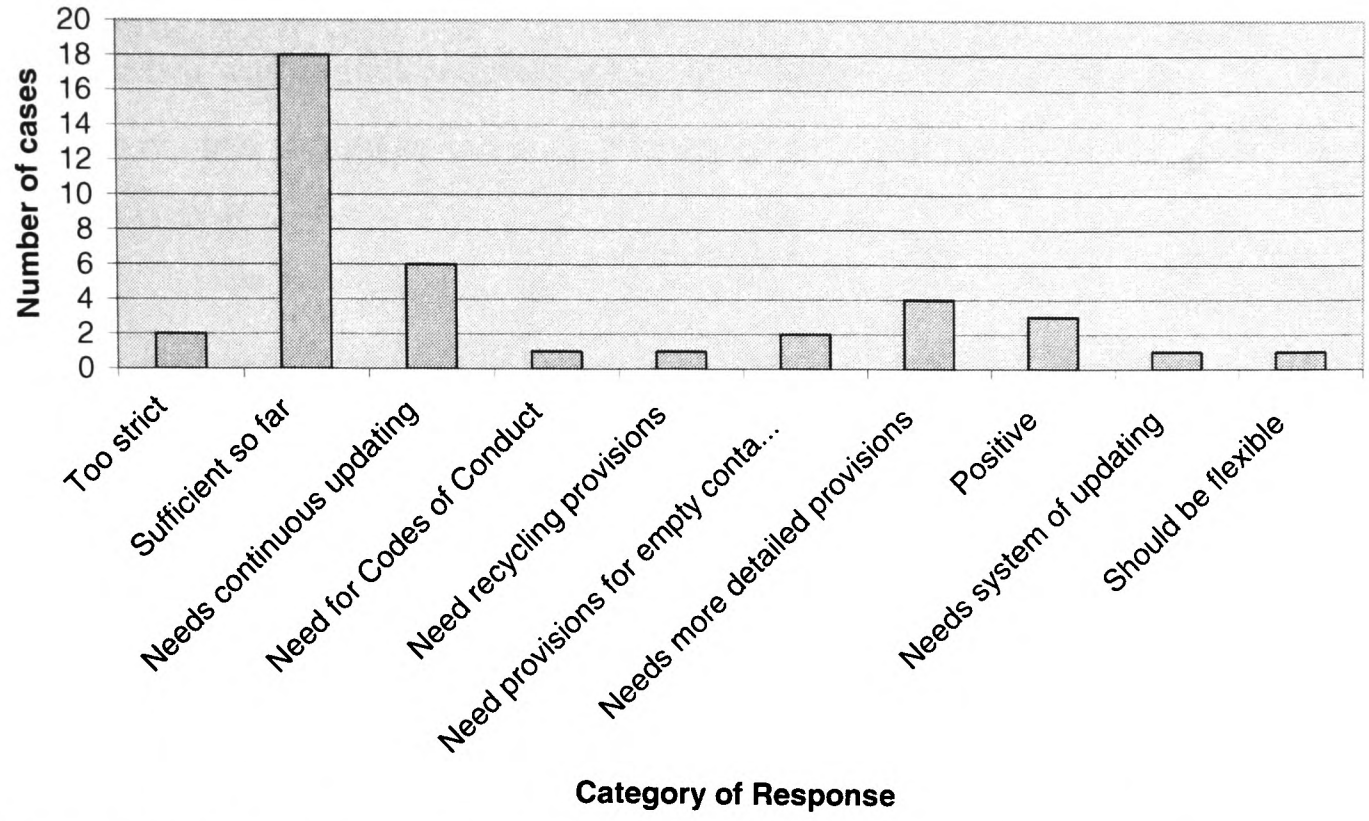


Figure 5.13: Opinions of the Pesticides Control Act (overall totals)

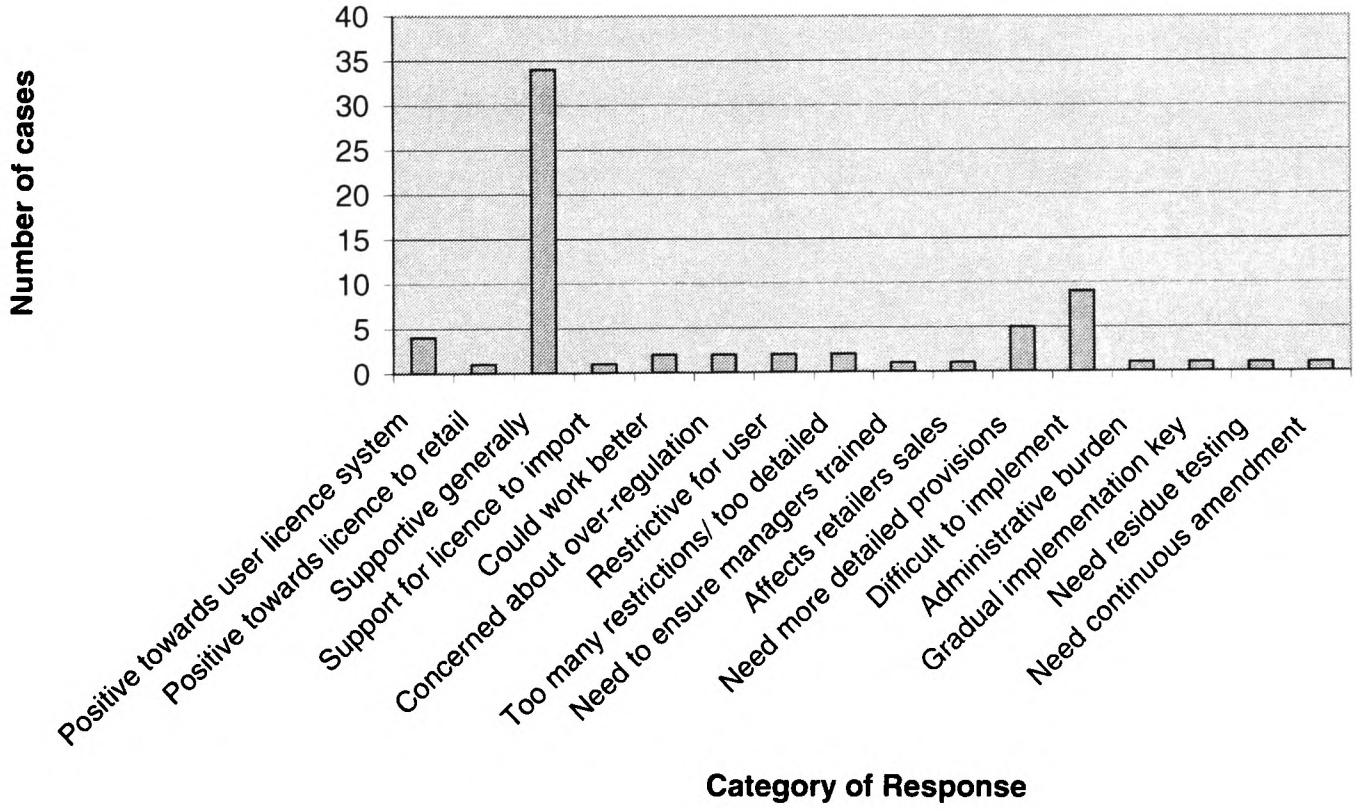


Figure 5.14: Attitudes towards the pesticide control regulations (overall totals)

Opinions of the pesticide control legislation, seen in Figures 5.13 and 5.14, were generally positive. Eighteen of the 47 interviewees (38%) indicated that they consider the Pesticides Control Act to have been 'sufficient so far'. Other coded responses indicate the perceived need to update continually the legislation and to

ensure that all necessary areas of pesticide control are sufficiently regulated. In this respect it was considered that further provision for some particular areas of pesticide control should be made. Two interviewees indicated that they feel that the Act is too strict.

More interviewees commented on the regulations, in terms of specific controls, than on the Act itself. In respect of the regulations, 34 of the 47 interviewees (72%) were identified as being generally supportive of the regulations. Some specific positive responses were coded. In particular, four interviewees, belonging to various stakeholder groups, viewed the regulations relating to the certification of pesticide users positively. Several specific issues that related to the implementation and effects of the regulations were identified; though generally by only one or two interviewees. Opinions on the effect of the regulations related primarily to the burden these placed on the regulated community, in terms of the restrictions that were involved and the financial and practical burden of implementing the regulations. Nine interviewees considered that the regulations are difficult for regulated stakeholders to implement (i.e. to comply with). Some responses indicate a need to increase further the scope of the regulatory controls.

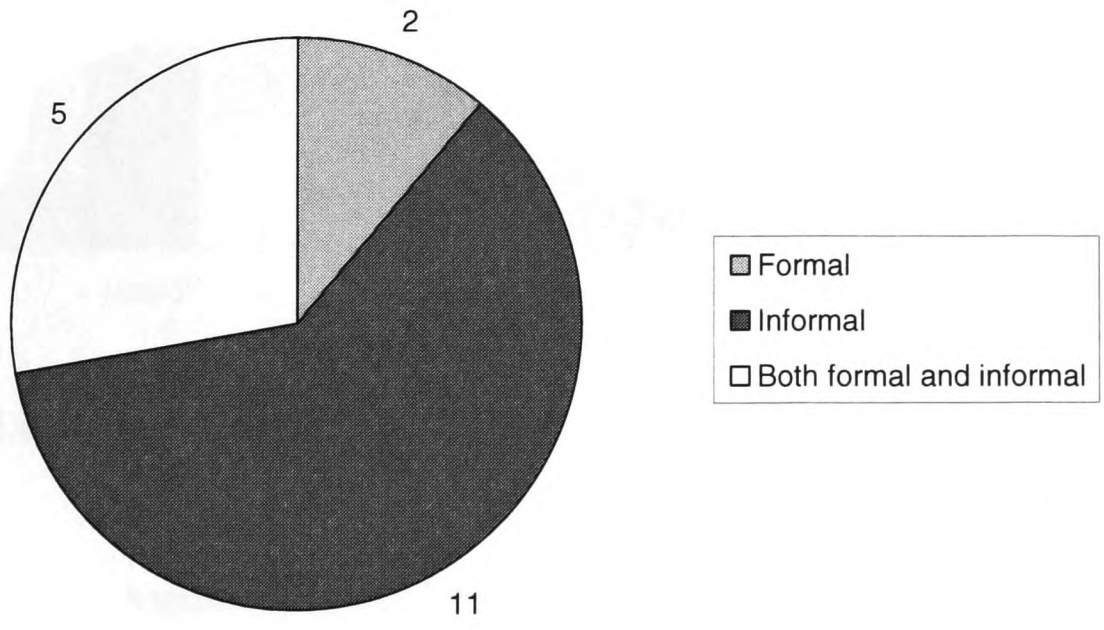


Figure 5.15: Perceptions of the PCB Technicians (overall totals)

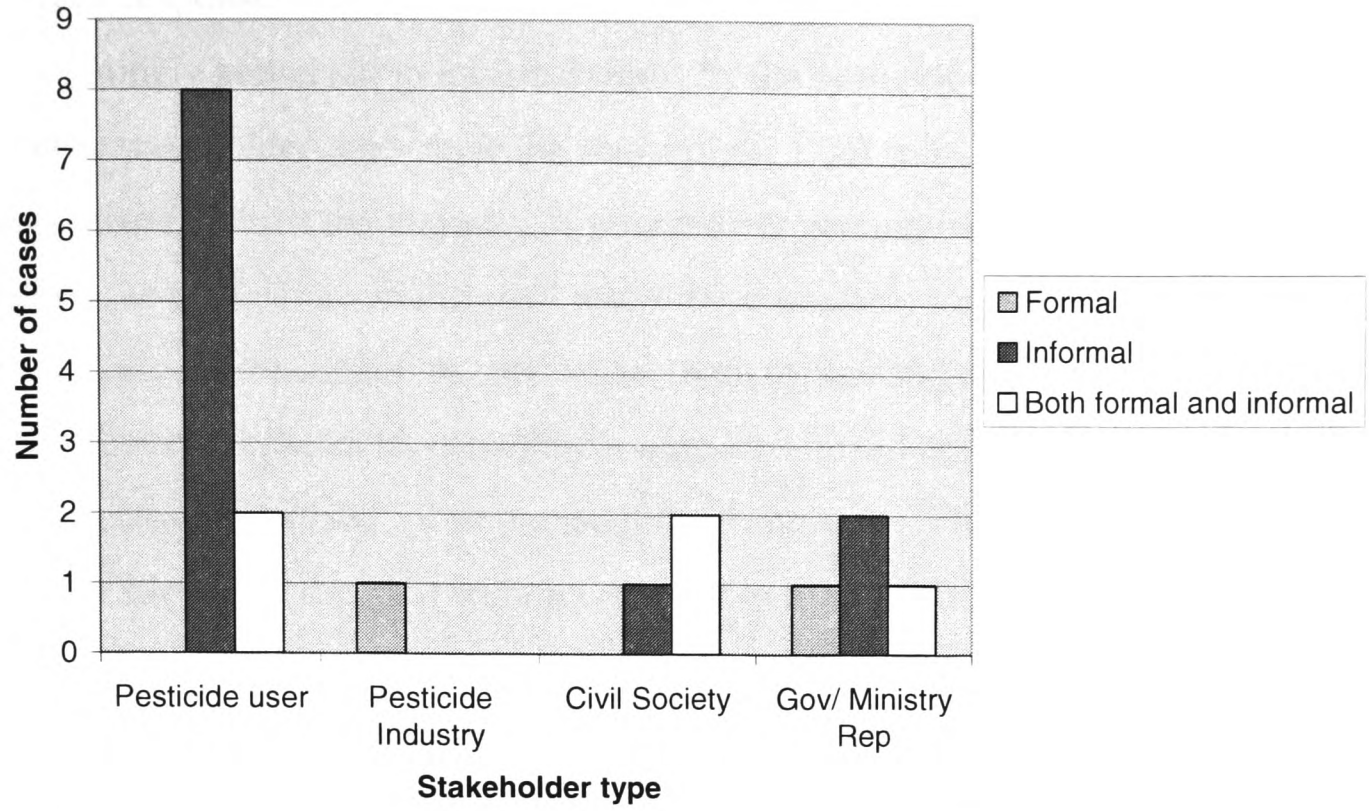


Figure 5.16: Perceptions of the PCB Technicians (by stakeholder type)

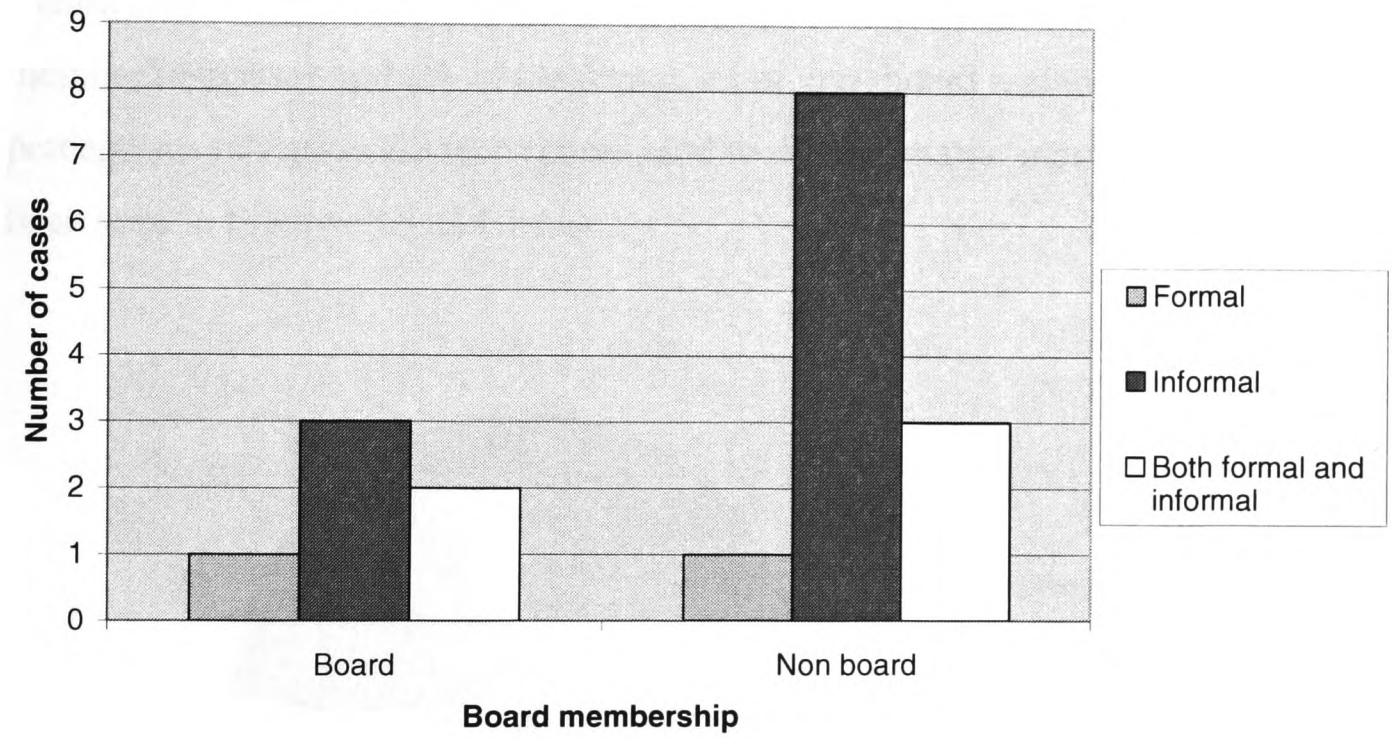


Figure 5.17: Perceptions of the PCB Technicians (by Board membership status)

The coded responses seen in Figures 5.15–5.17 indicate that, overall, stakeholders view the PCB technicians primarily in informal terms. Eleven of the 18 coded responses (61% of those responses) perceived the PCB technicians in informal terms with a further five responses (28% of those responses) perceiving the technicians in both formal and informal terms. However, there is some contrast

between responses according to stakeholder type. Whilst the PCB technicians were strongly perceived in informal terms by the pesticide users, the perceptions of other stakeholder types as to the status of the PCB technicians appear to be more mixed. Whilst the majority of government and ministry representatives viewed the technicians in informal terms there was also some identification of the technicians in formal and 'mixed' terms (both formal and informal). Amongst civil society stakeholders, perceptions were also mixed but with a more frequent identification of 'mixed' perceptions of the technicians. The agro-chemical industry identified the PCB technicians only in formal terms.

Both Board members and non-members perceived the technicians predominantly in informal terms. The distribution varied slightly: an informal perception of the technicians was coded for eight of the twelve non-board members (66% of those cases) compared with three of the six Board members (50%). Perceptions of the technicians in formal terms were relatively low, accounting for 17% of the Board member responses and 8% of the responses of non- board members. (Positive perceptions related to the technicians, and to the Secretariat more generally, have been seen in Figures 5.8 and 5.11).

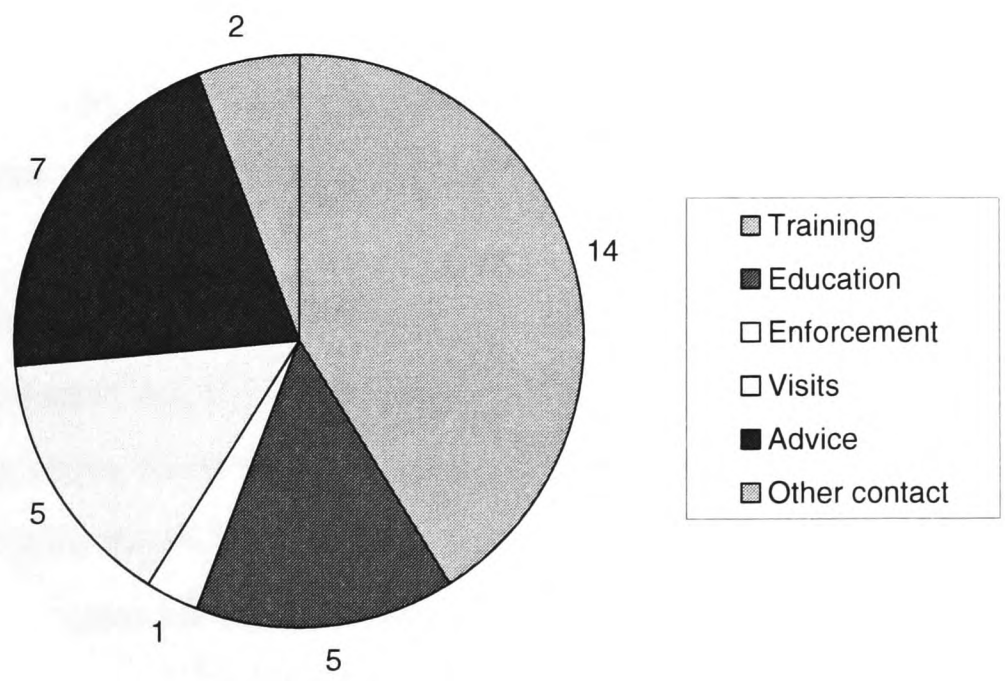


Figure 5.18: Pesticide user's contact with the PCB (totals)

Table 5.1: Pesticide user's contact with the PCB

Case Number	Type of Contact					
	Training	Education	Enforcement	Visits	Advice	Other
8	X					
9	X				X	X
10						
20	X				X	
21	X			X		
23	X				X	
24	X				X	
25	X	X		X		X
26	X			X		
27	X				X	
28	X					
29	X				X	
32		X				
33	X					
34			X	X	X	
35		X				
39	X	X		X		
45	X	X				
Totals	*14*	*5*	*1*	*5*	*7*	*2*

The findings in Figure 5.18 and Table 5.1 indicate that the most common type of contact that pesticide users have with the PCB is involvement in the PCB's training of pesticide users. Fourteen of the 18 pesticide users (78%) identified having been involved in or having received training. Thirty-nine percent of all pesticide users interviewed also identified having received advice from the PCB. Twenty-eight percent of users identified having been involved with some type of educational activity. Twenty-eight percent had received 'visits' from the PCB, which were not identified as enforcement.

Examining these results by case (Table 5.1) indicates that only one of the pesticide users interviewed (Case 10) indicated that he/she had no contact with the PCB. Of the remaining cases, those that had not received training indicated that they had other contact with the PCB. Recognition of having been subject to enforcement, in the formal sense, was identified in only one case. Generally, there was more recognition, amongst the pesticide users, of their being involved in co-operational and educational activities with the PCB than in formal enforcement. It has been seen, in Figures 5.15–5.17 that stakeholders perceive the technicians largely in

informal terms and the contact identified by pesticide users further suggests that this has been the approach.

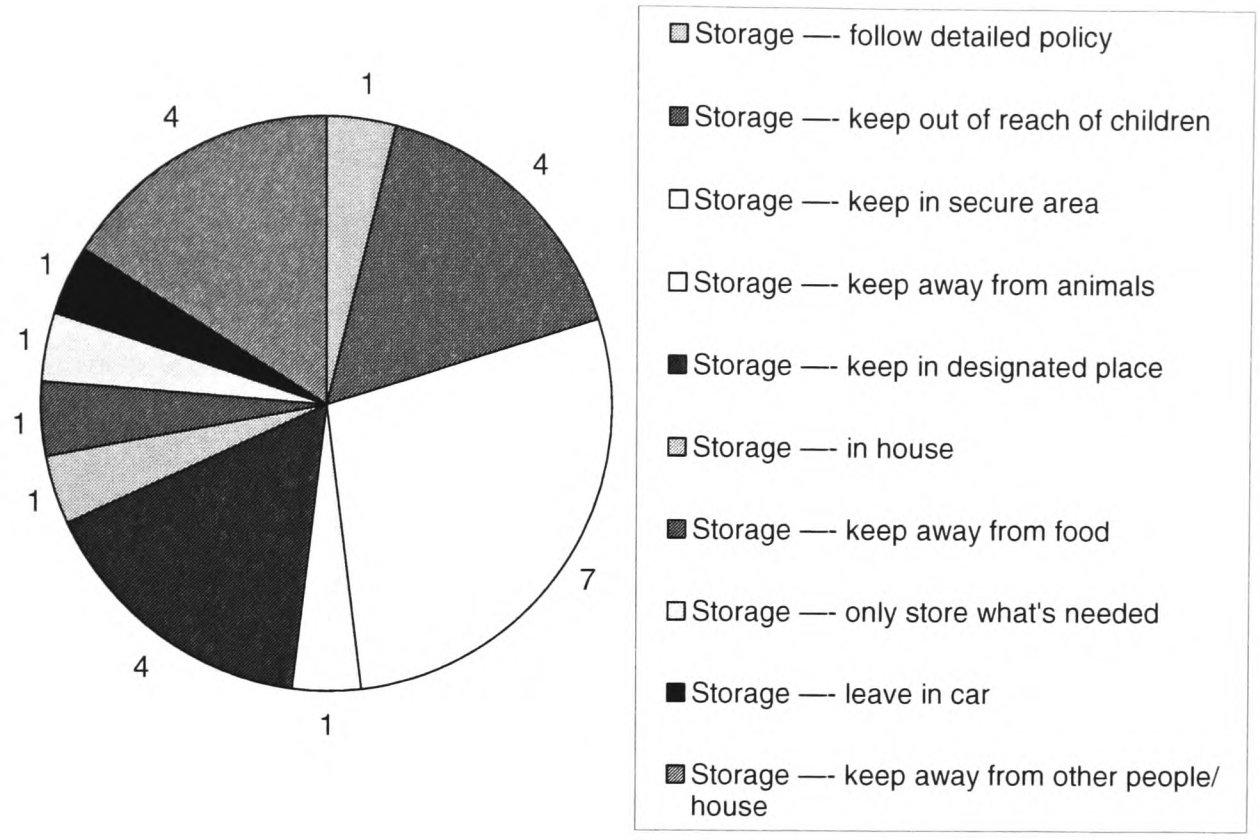


Figure 5.19: Pesticide user practices: storage (totals)

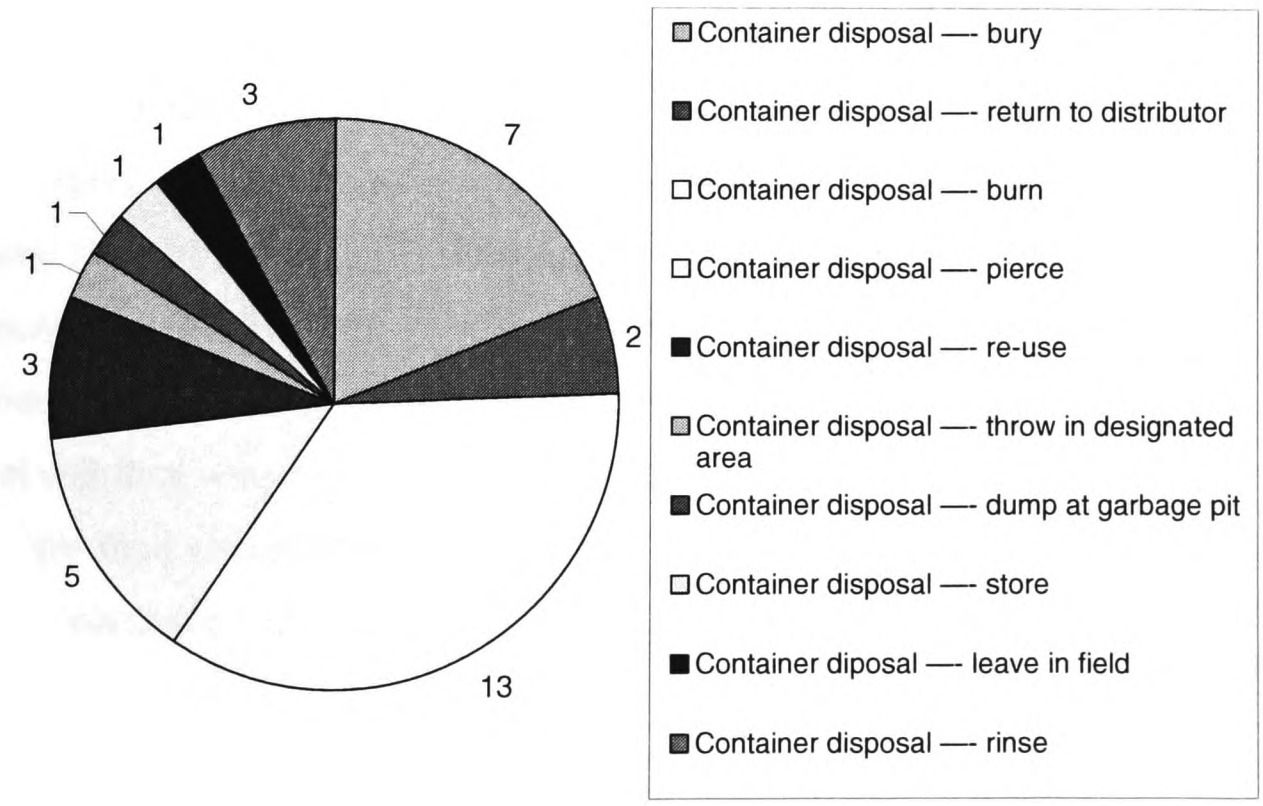


Figure 5.20: Pesticide user practices: container disposal (totals)

It has been seen in Figure 5.12 that stakeholders, overall, displayed a good level of awareness of the general purposes of regulating pesticides. The findings in Figures 5.19 and 5.20 above indicate (self-reported) pesticide user practices for two particular aspects of pesticides control: the disposal of empty pesticide containers and the storage of pesticides (based on grounded theory coding). It can be seen that several pesticide users demonstrated a good knowledge of safe practices for pesticide storage (and by extension good levels of compliance—assuming that these self-reported practices are in fact followed). Seven of the 18 pesticide users interviewed indicated that they keep pesticides in a general secure area. In four cases pesticide users indicated that they specifically keep pesticides out of the reach of children and in four cases again pesticide users indicated that they store pesticides in a designated area. Storage of pesticides in a separate, secure place, away from children, animals and food or seeds is recommended by the PCB through training. One interviewee indicated that he stored pesticides in his home and one interviewee indicated that pesticides were stored in his vehicle. These practices would not be in accordance with PCB recommendations.

Again, with respect to empty pesticide container disposal, several users demonstrated a good knowledge of recommended practices. Thirteen of the 18 pesticide users interviewed indicated that they burn empty pesticide containers in order to dispose of them. Seven pesticide users indicated that they would bury the containers. Burial or burning (depending on the material) are the practices recommended by the PCB, through training. Some users also indicated that they would pierce or rinse empty containers before disposal. Three interviewees indicated that they would re-use the containers and three users indicated that they would throw their containers away, in some way. These latter two practices might not be in accordance with recommended safe use practices.

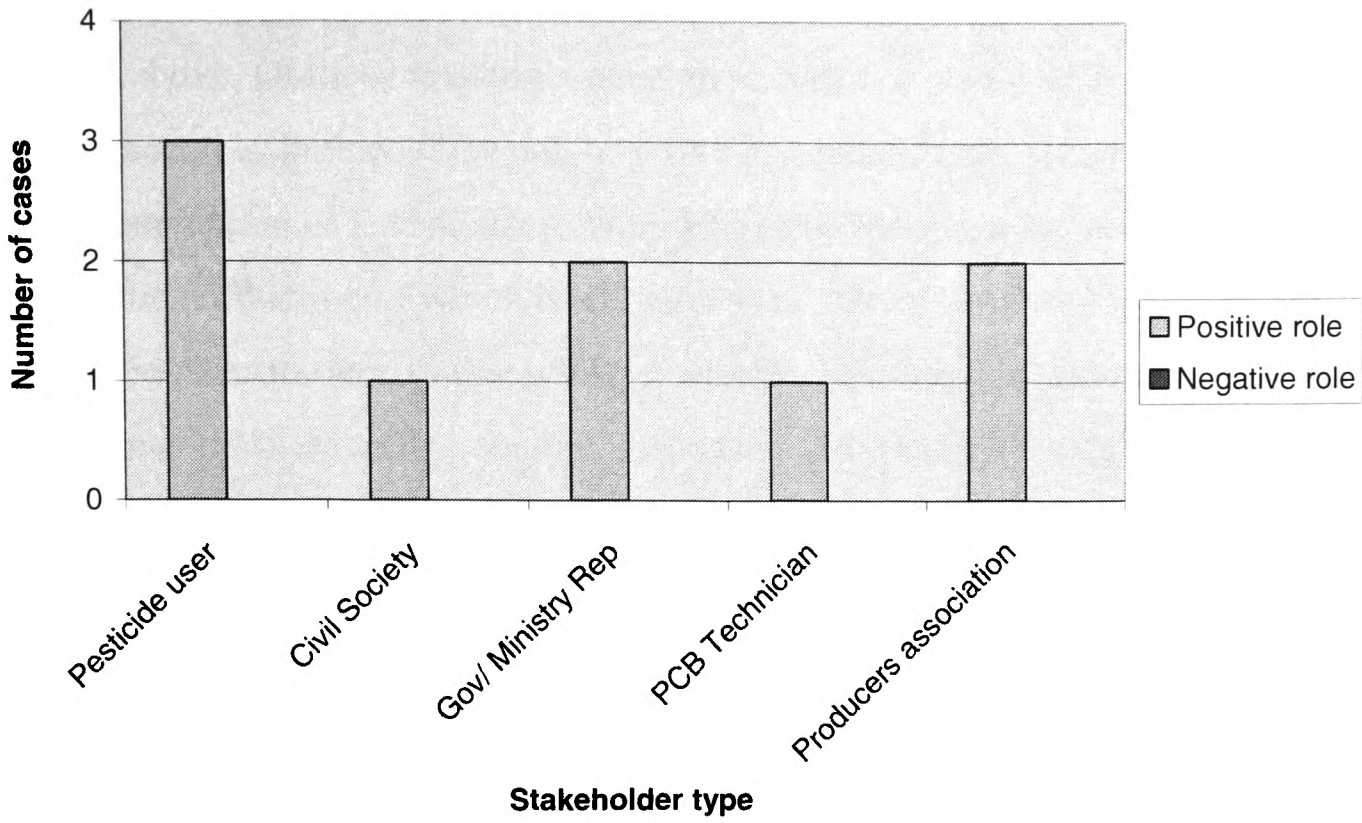


Figure 5.21: Perceptions of the role of education (by stakeholder type)

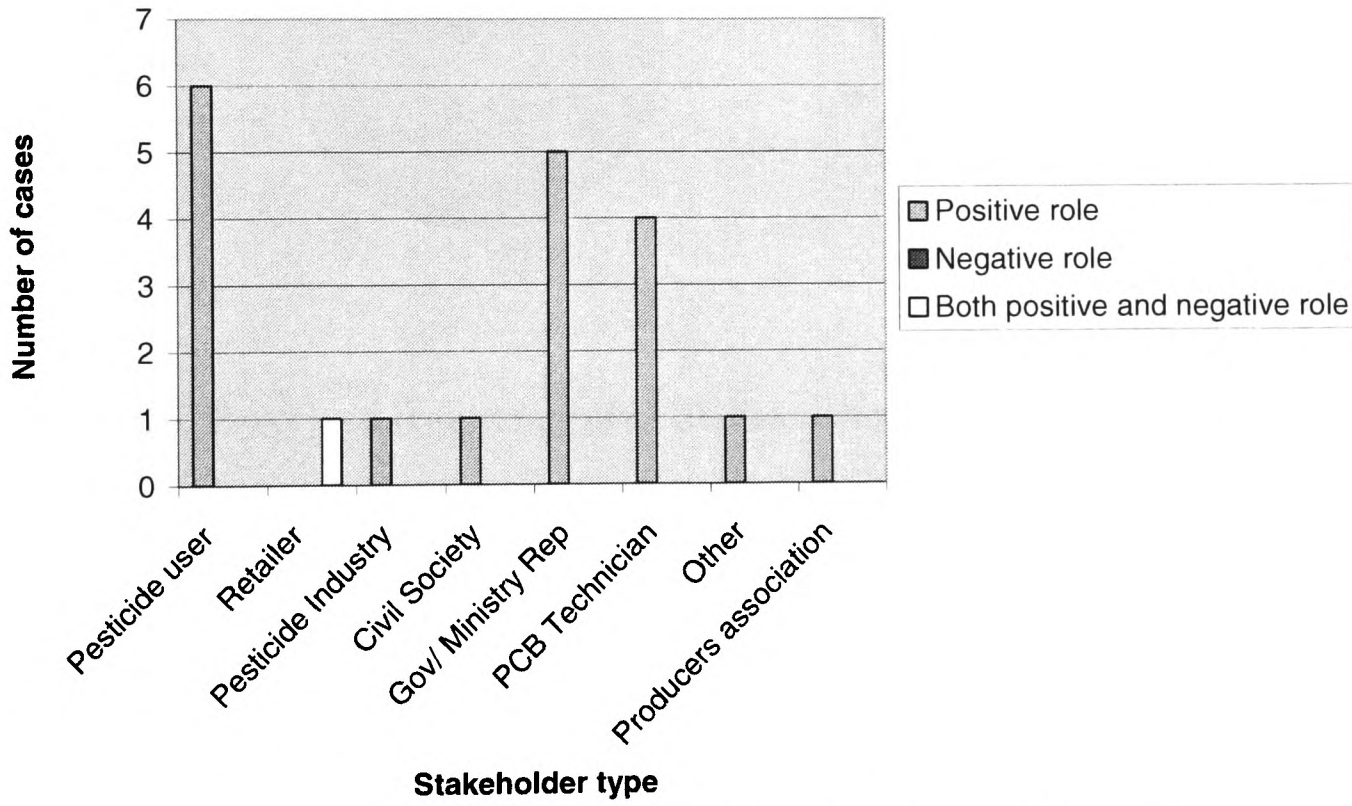


Figure 5.22: Perceptions of the role of training (by stakeholder type)

Training and education have been important components of the pesticide control framework (see Figure 5.18) and it has been seen that on some occasions this has been identified as a strength of the framework (Figure 5.11). Perceptions of the role of education and of training specifically were examined and coded perceptions indicate that these aspects of the pesticide control framework are viewed positively. Responses specifically indicating a positive or negative

perception of training or education were coded and can be seen in Figures 5.21 and 5.22 above. Of those responses none were coded as solely negative and only one was coded as both positive and negative in relation to the role of training. This was the perception of a pesticide retailer who considered that the certified user licence, the production of which is a condition of sale of restricted pesticides, has a negative impact on sales so that whilst it was identified as a "good idea" it also causes some problems. Nine positive responses specifically relating to the role of education were coded and 19 positive responses were coded in relation to the role of training.

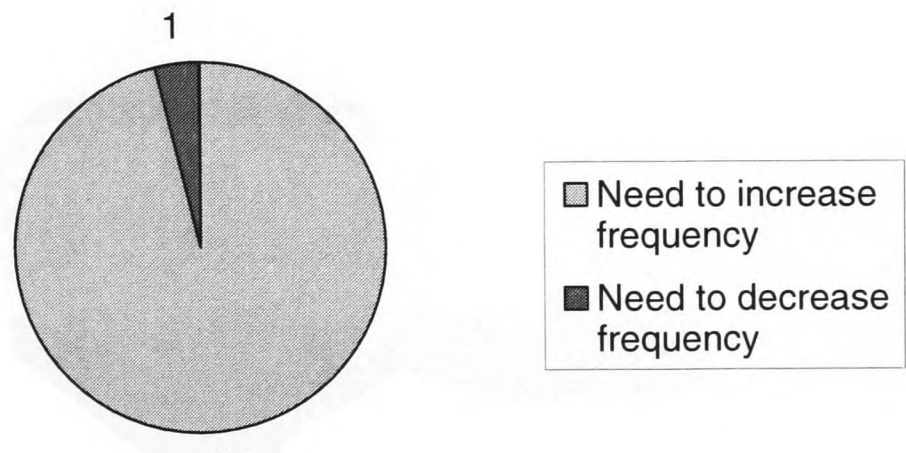


Figure 5.23: Perceived frequency of activities (overall totals)

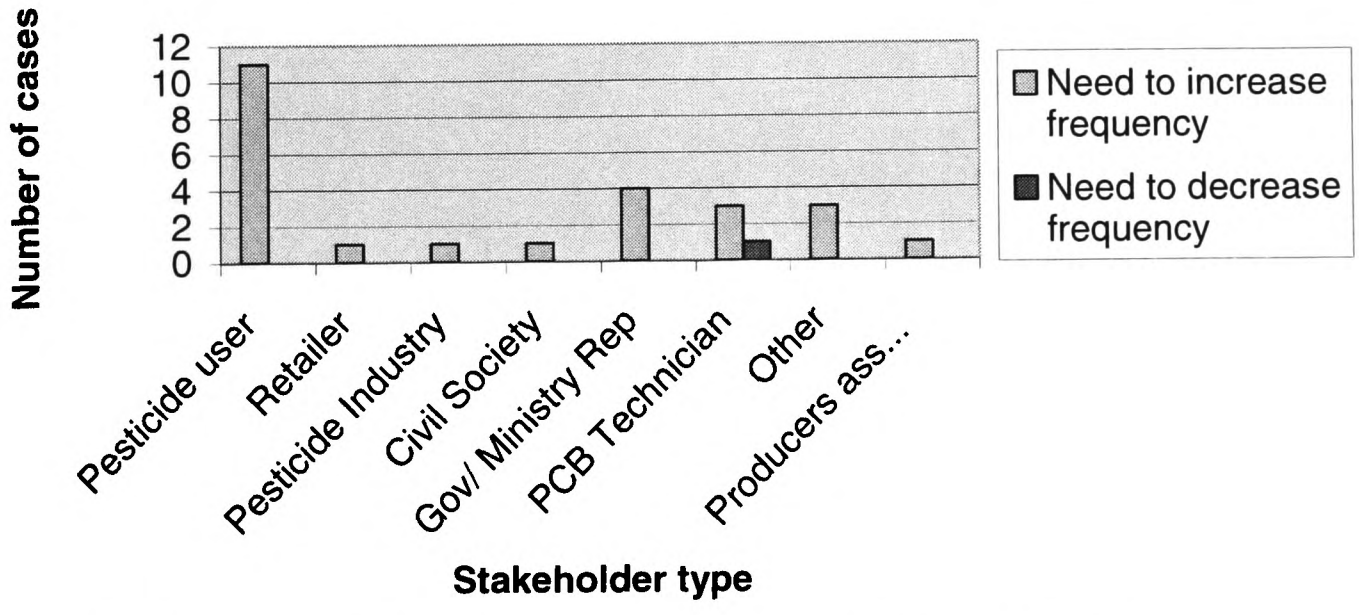


Figure 5.24: Perceived frequency of activities (by stakeholder type)

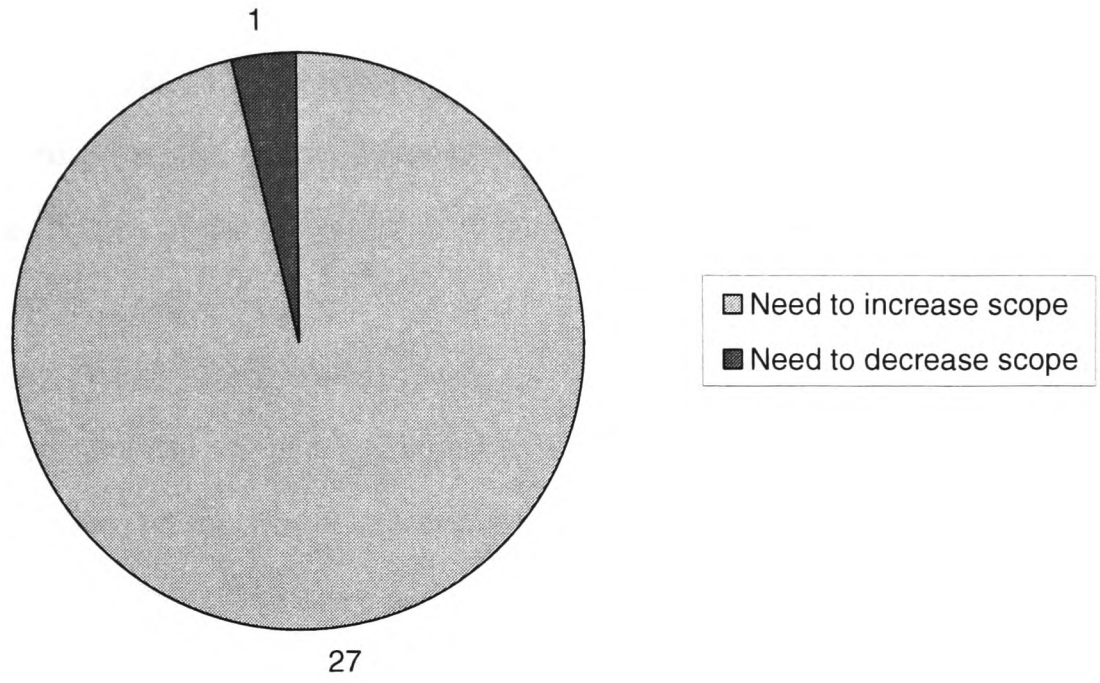


Figure 5.25: Perceived scope of activities (overall totals)

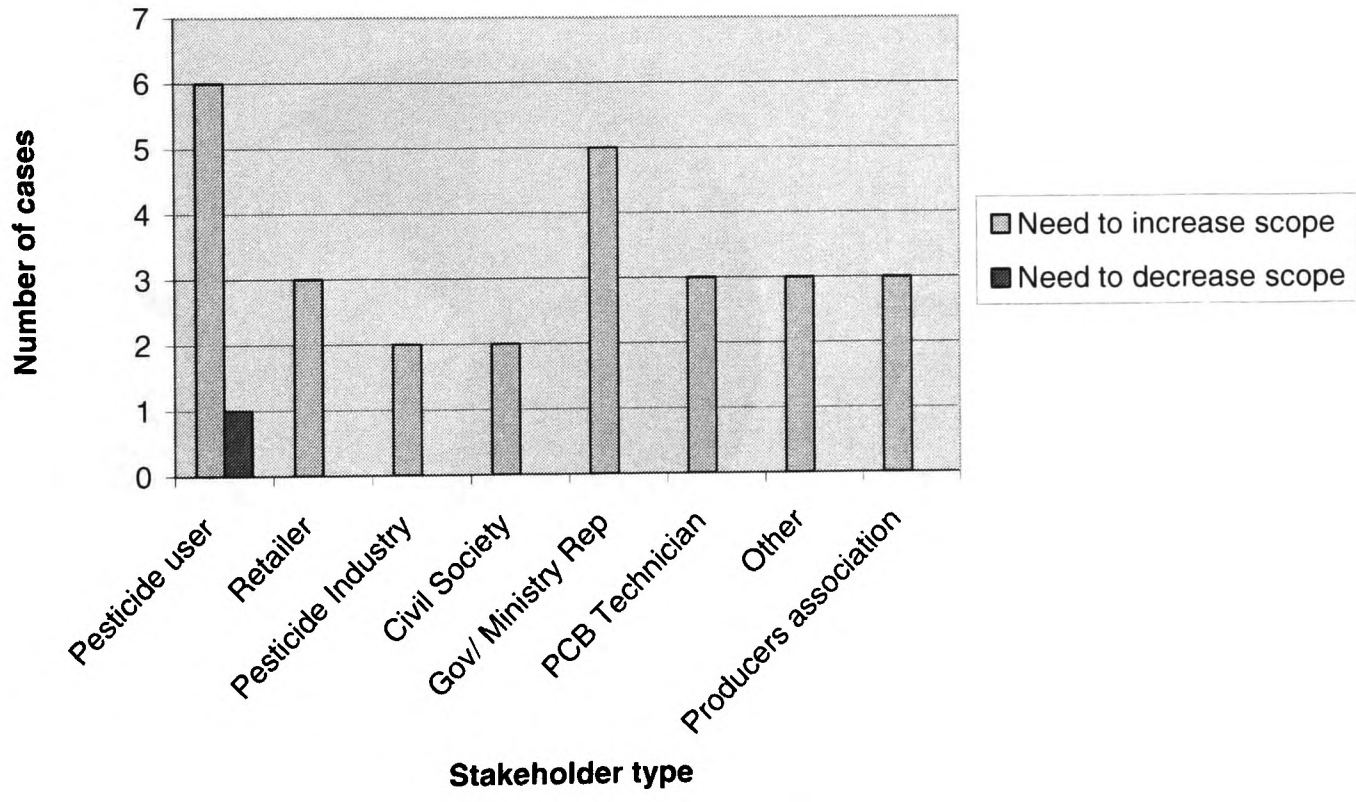


Figure 5.26: Perceived scope of activities (by stakeholder type)

It can be seen that a number of interviewees consider that the PCB needs to expand the scope and/or frequency of the activities that it carries out. Overall, 53% of all interviewed stakeholders suggested that the frequency at which current activities are carried out should be increased. The most frequently referred to

activities in this respect were training, as well as other educational and public awareness activities and monitoring and enforcement activities, including farm visits. One interviewee, a PCB technician, considered that the frequency should be decreased. In this case the interviewee felt that the PCB is focusing too heavily on educational activities at the expense of other work.

Fifty-seven percent of interviewees considered that the scope or range of activities that the PCB carries out should be expanded. These perceptions related to both the targets of activities, to the geographical location in which activities take place and also to the type of activities that are carried out. One interviewee indicated that he/she felt the scope should be decreased. In this instance, the interviewee was a pesticide user who felt that the scope of the law was expanding with more and more practices being controlled and that this posed a problem in terms of the regulatory burden on farmers.

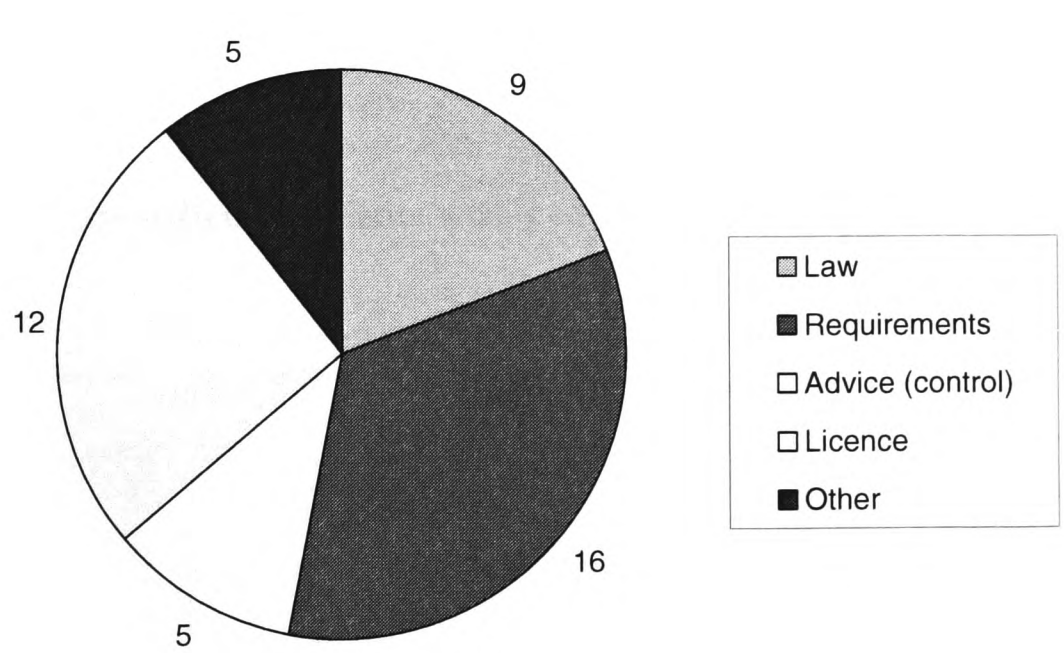


Figure 5.27: Identified sources of pesticide control (totals)

Figure 5.27 presents sources of pesticide control as recognised by the pesticide users. The recognition of sources of control was coded by instance rather than by interview (case), so more than one source of control might be coded within a given interview. It can be seen that in almost all cases, (89% of those pesticide users interviewed), 'requirements' were identified in relation to pesticide use and

handling. Formal recognition of pesticide control measures as 'law' was less frequent but was still identified by 50% of those pesticide users interviewed. An important source of control, coded separately, was the certified user licence. This was identified in 67% of cases. In these instances controls were identified as a requirement of the certified user licence.

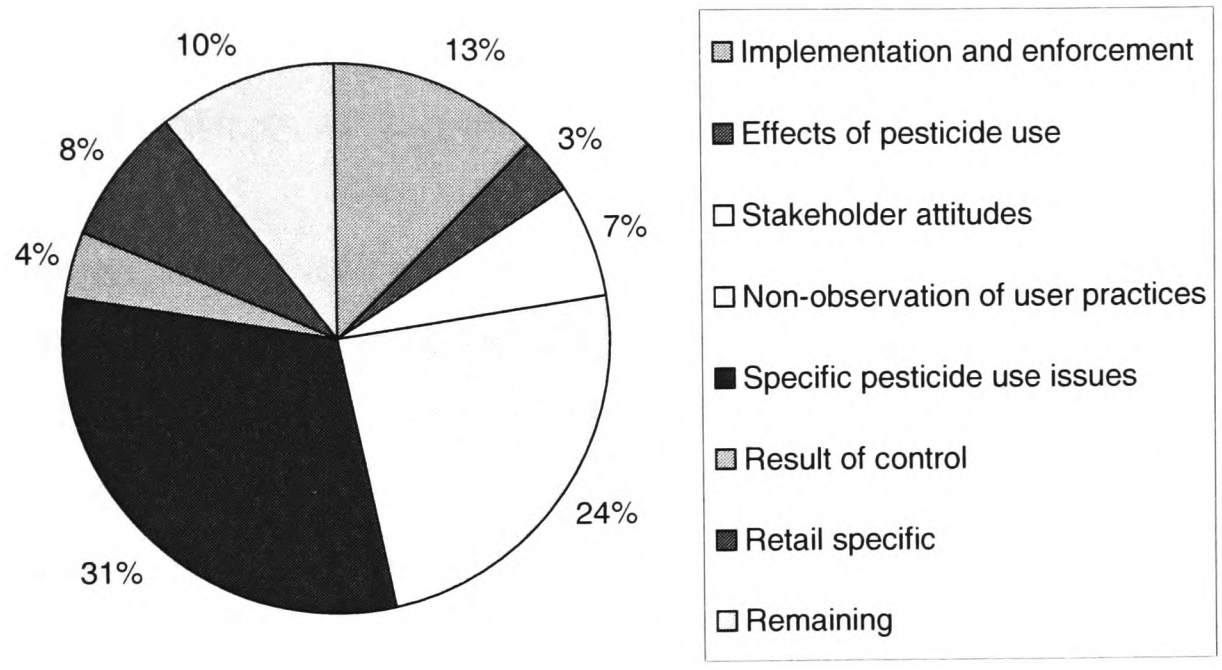


Figure 5.28: Identified problems with pesticides control (by broad groupings)

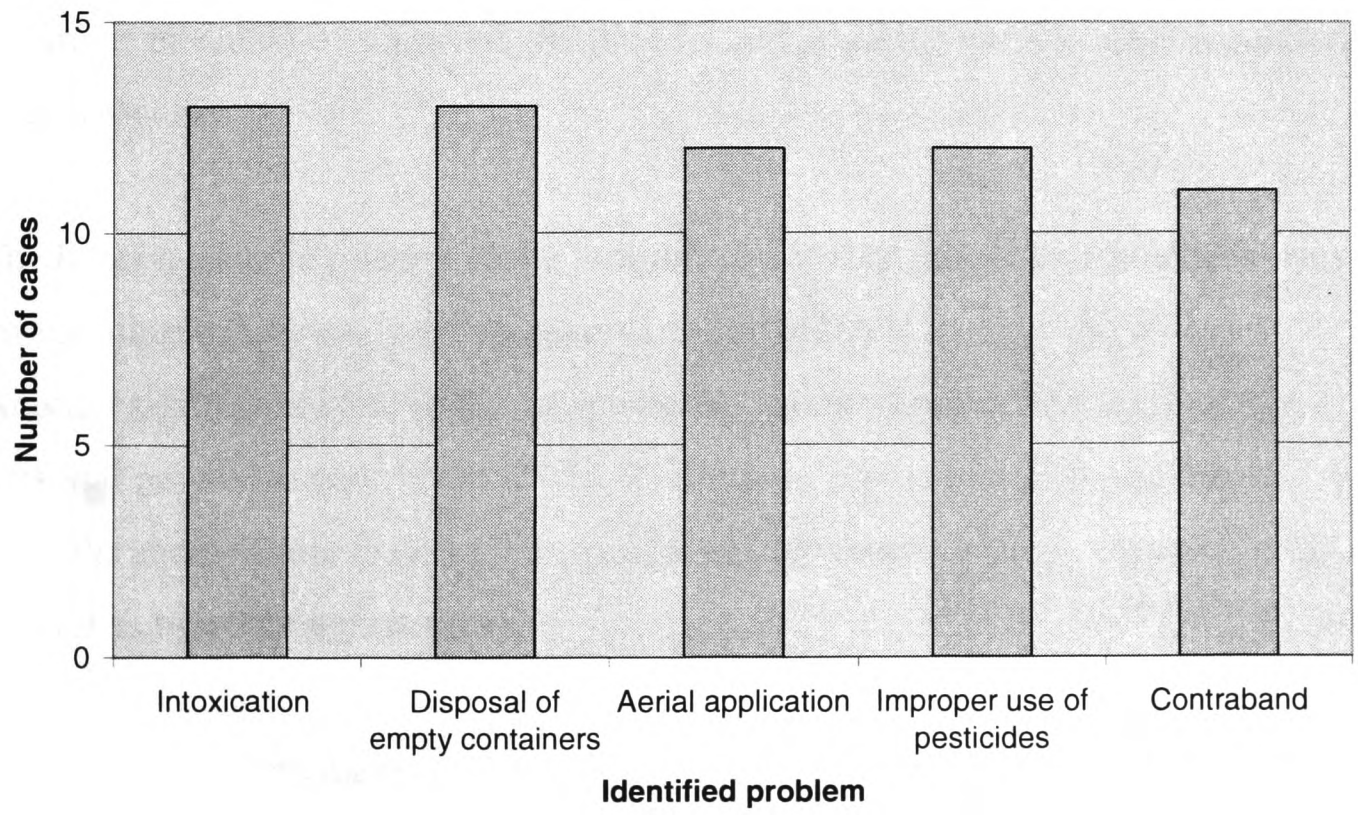


Figure 5.29: The five problems most commonly identified with pesticides control (total cases)

Identified problems with the pesticides control framework are shown in Figures 5.28 and 5.29. Problems were coded through grounded theory analysis. In Figure 5.28 problems are grouped and presented by broad area. It should be remembered that since these codings were achieved through grounded theory analysis, more than one problem could be identified by any interviewee and groupings will reflect this distribution. For example, one interviewee could have mentioned three problems all falling within the same broad area. Figure 5.28 is, therefore, only indicative of the distribution of problems and should be viewed with the full breakdown of problems, as in Appendix 7, Table A7.1.

Thirty-one percent of identified problems were coded as 'specific pesticide use issues'. The problems in this area were primarily concerned with pesticide users not complying with recommended practices, particularly for aerial application and disposal of empty containers, though identification of problems in these areas by pesticide users was low. Aerial application was cited as a problem by just two pesticide users and disposal by one. The lack of existing regulations for the aerial application of pesticides, and, to a lesser extent, pesticide disposal, was also cited as a problem. Lack of facilities or appropriate equipment for disposal or recycling was cited as an issue for container disposal and for the disposal of chemicals including obsolete chemicals. Problems with rebottling and storage relate to the failure of pesticide retailers and distributors and pesticide users to meet regulatory requirements.

The biggest issue in relation to the 'non-observance of proper user practices' was intoxication which was, overall, identified as a problem in 13 of the 47 cases. Another significant issue in this area was the failure of pesticide users to use personal protective equipment (PPE). Reluctance, on the part of pesticide users, to use PPE and a failure to do so was recognised, to some extent, by pesticide users as well as by other stakeholders.

The issues in 'implementation and enforcement' relate largely to the PCB not carrying out sufficient enforcement and monitoring activities. 'Retail specific' problems were both those **identified** by retailers and problems **caused** by retailers

and include the sale of goods which are damaged in some way (including those improperly labelled, in damaged containers, or physically damaged or diluted) and to the non-application of the certified user licence.

Problems resulting from the 'effects of pesticide use' were identified almost entirely by pesticide users, with the exception of pesticide residue issues. These issues were each mentioned by only one or two interviewees and generally relate to the effects of improper use of pesticides rather than to the effects of the pesticides themselves. Problems related to 'stakeholder attitudes' towards pesticide control were relatively minor but generally reflected a feeling that regulated stakeholders were not implementing safe practices due to the [negative] attitude they have towards them. Another perception was that users did not see the point of the user licence since they were not being asked for it by the retailers. This was not, however, an issue identified by the pesticide users themselves.

The limited availability and high cost of pesticides were issues identified by a few stakeholders as problems resulting from the control of pesticides. Of the remaining issues, the most frequently cited problems related to pesticide labelling and mainly concerned accessibility to pesticide users, both in terms of the user's level of literacy and the language of the label (where this was unsuitable). Another issue in this category, for pesticide users, was the lack of availability of PPE.

Specific problems can be seen in Figure 5.29. Intoxication was identified as a problem in 28% of all cases. The figure was lower amongst pesticide users (22%) and was highest amongst government representatives and producers associations (both at 50%). 'Improper use of pesticides' was also identified as a problem in 28% of cases. This category identifies the issue of pesticide users generally not using pesticides safely and responsibly in accordance with PCB recommendations and regulations. The problem of 'contraband' pesticides was identified in 23% of cases. The biggest issue in relation to contraband was that of the illegal importation of pesticides across Belize's borders rather than resale of illegal pesticides within Belize.

Two of the problem areas, 'aerial application' and 'disposal of empty containers', were specifically identified and discussed during interviews. Both of these problems were identified in 26% of cases. Though these issues appeared, from the interview responses as a whole, to be relatively common problems, they were not identified as such by pesticide users. Aerial application and improper storage were coded as problems in just two of the eighteen pesticide user interviews; disposal of containers was coded in one interview (though aerial application was relevant to only a few of the users). In relation to both of these areas, improper use and a lack of specific regulation were considered to be issues. Rebottling (the third area specifically discussed in interviews) was not coded at all for pesticide users.

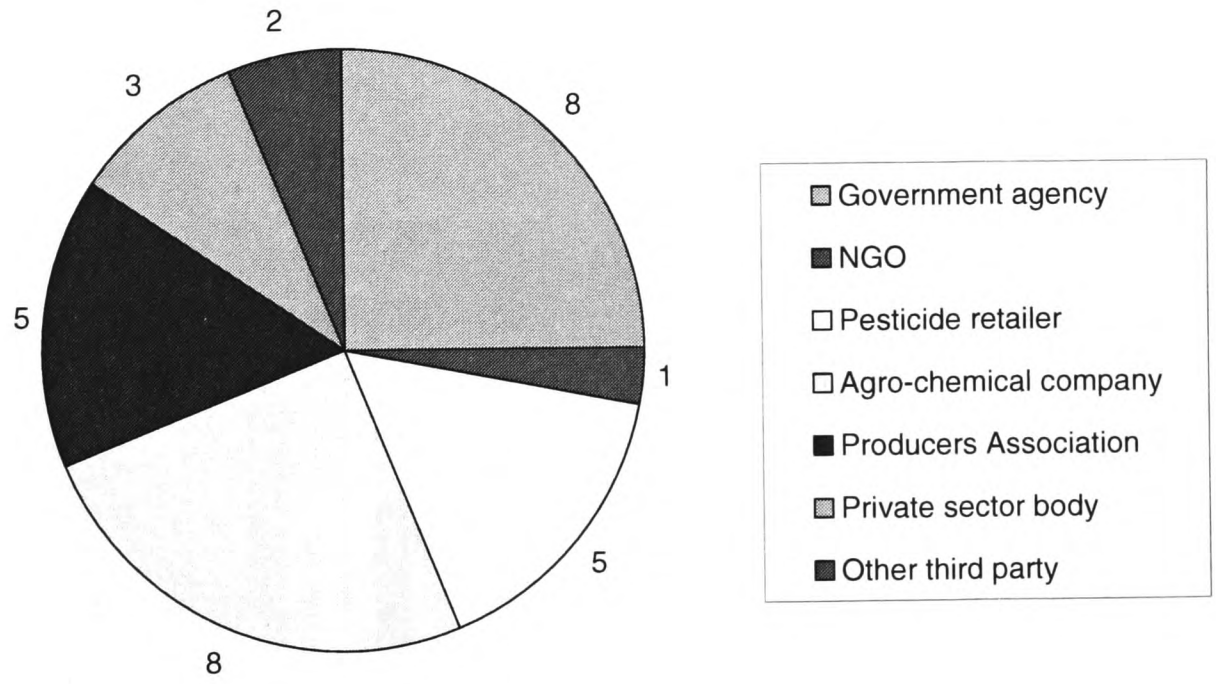


Figure 5.30: Identified third party types (total cases)

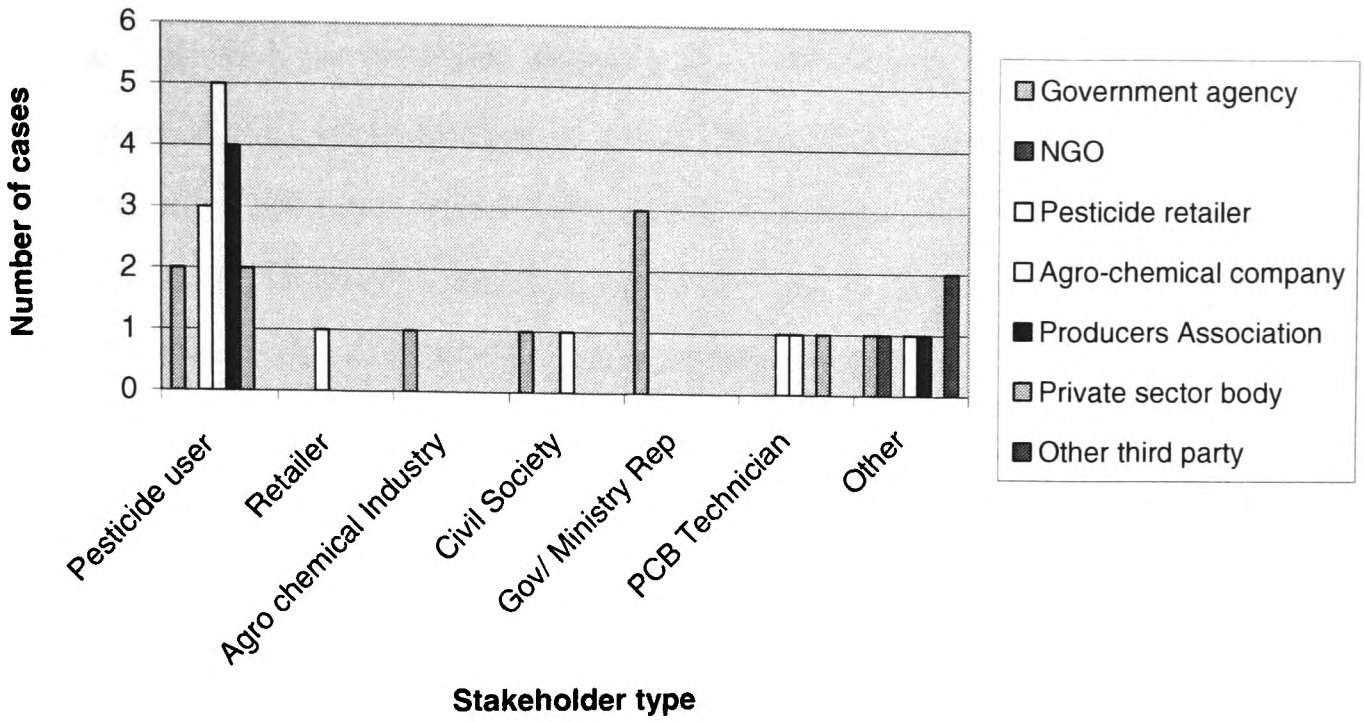


Figure 5.31: Identified third party types (by stakeholder type)

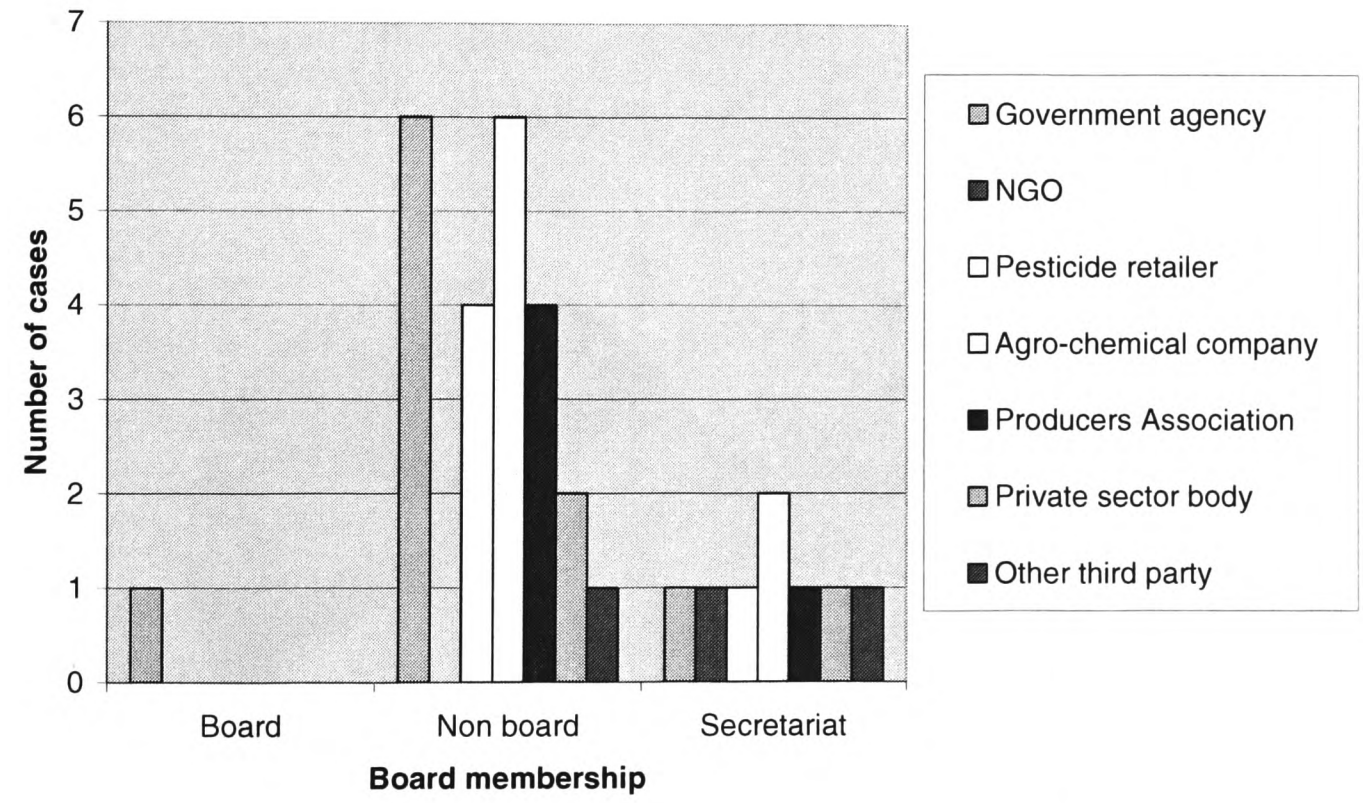


Figure 5.32: Identified third party type (by Board membership status)

The findings in Figures 5.30–5.32 show that several types of third party have been identified as playing a role within the pesticide control framework. The most common of these are the agro-chemical companies and other government agencies, each identified in 25% of the all coded responses. The perceived involvement of different third parties varied between stakeholder types. Pesticide

users most commonly identified the agro-chemical companies as third parties but there was little identification of these as third parties by other stakeholder types. This was followed, for pesticide users, by the involvement of producers associations. Again, identification of the involvement of this third party was very limited amongst the other stakeholder types. Amongst other stakeholder types there was a more frequent identification of the role of other government agencies. The 'other third parties' identified, each in one case, were the Board members generally and the quarantine officers of the Belize Agricultural Health Authority. This recognition was specifically in terms of their giving advice rather than having a role within other government agencies.

The findings in Figure 5.32 indicate that there is very limited recognition of the role of third parties amongst Board members. Both non-board members and the Secretariat members identified a number of different third parties having a role in the pesticides control framework but only one such response was coded for Board members (identifying other government agencies).

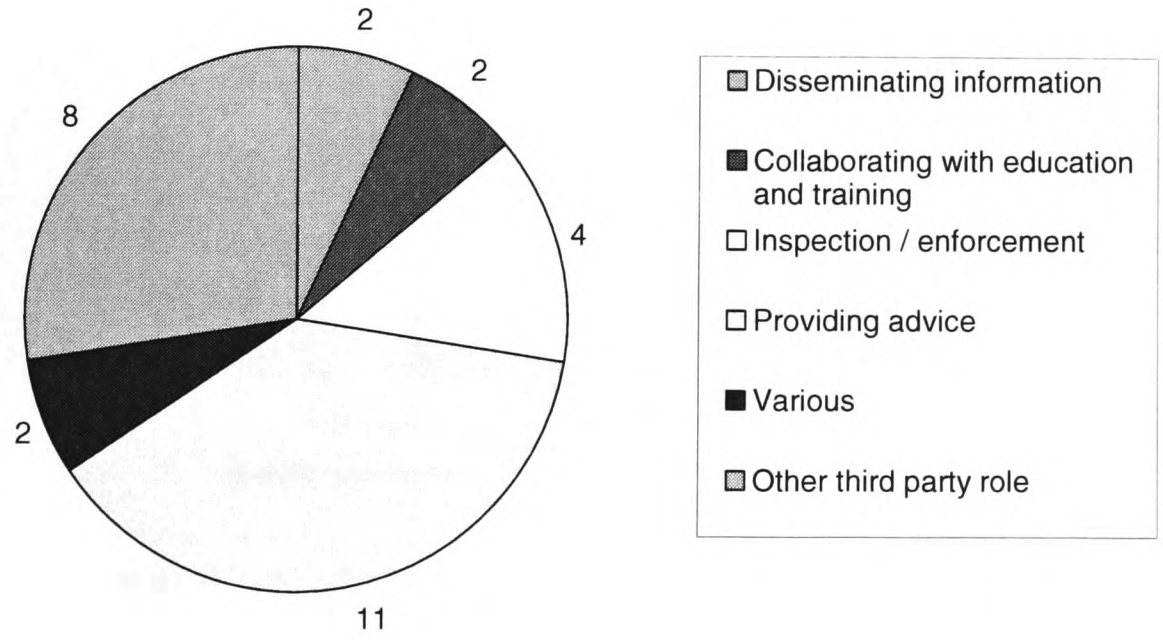


Figure 5.33: Identified role of third parties (overall totals)

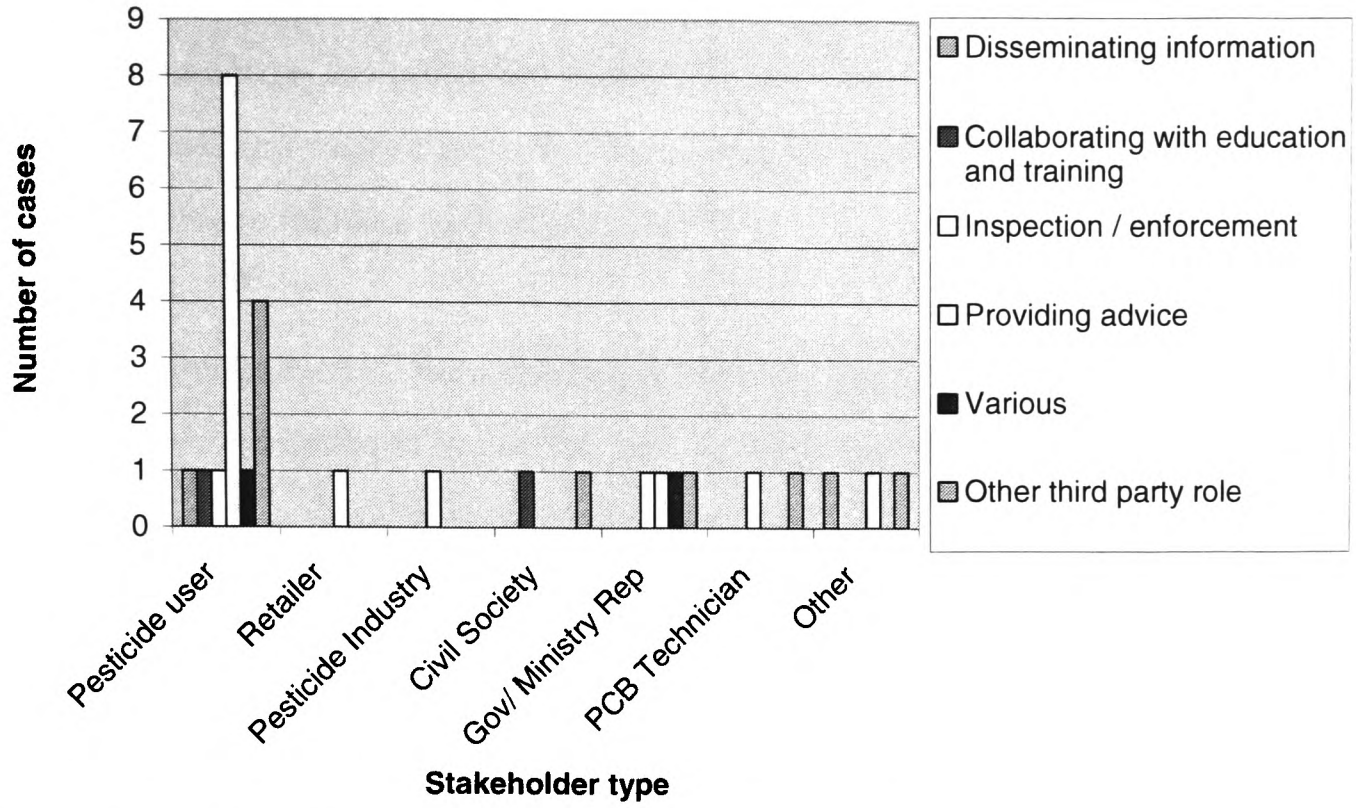


Figure 5.34: Identified role of third parties (by stakeholder type)

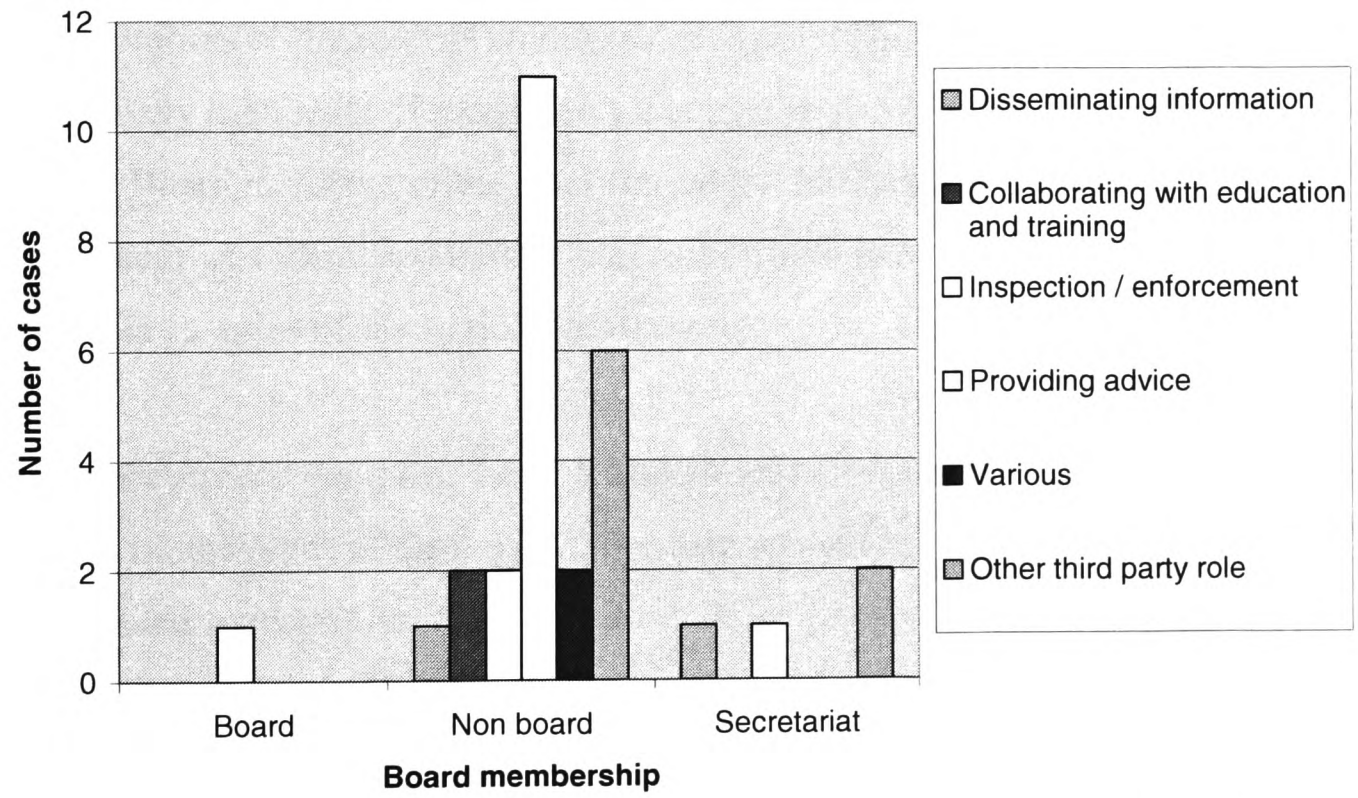


Figure 5.35: Identified role of third parties (by Board membership status)

The findings show that the identified third parties are perceived as playing a number of different roles within the pesticide control framework. The most common of these, accounting for 38% of coded responses, is providing advice. The second most commonly identified role, accounting for 28% of those responses, is 'other role'. This category includes technical and regulatory activities

such as residue testing, the control of veterinary pesticides, the recycling of empty pesticide containers, the provision of policies and procedures for pesticide use, the supervision of, and assistance with, pesticide application, and the allocation of medical clinics in relation to pesticide injury.

Generally, recognition of the various roles was evenly distributed with the various roles each being identified in one instance by each stakeholder type. However, there was a relatively high recognition by pesticide users of the role of third parties in providing advice; this was identified in eight cases, or 44% of the 18 pesticide users interviewed (50% of pesticide user responses to the role of third parties). 'Other' third party roles were identified in 25% of those pesticide user responses. These related to recycling empty containers, provision of policies and procedures, supervision and assistance with pesticide application and the allocation of medical facilities. It can be seen from Figure 5.35 that there is recognition amongst non-board members of the roles played by third parties. This is of course influenced by the relatively high level of recognition amongst pesticide users. Recognition amongst Board members of the roles played by third parties is very limited. Such involvement was identified in only one case, which indicated that third parties play a role in terms of inspection/enforcement.

The co-occurrence matrix in Table 5.2 shows the co-occurrence of the role of third parties with the types of third party. The data presented shows the frequency with which coded segments overlapped. . Since these categories were coded by **instance** rather than by **case occurrence**, it should be noted that more than one response could be coded to the same piece of text (e.g. two different third party types identified). Very occasionally, therefore, there may be a slight margin of error.

The findings in Table 5.2 indicate that the most common third party role, 'providing advice', is associated with a number of different third parties, most commonly other government agencies and pesticide retailers. The category 'other third party role' is associated with the agro-chemical companies and with other government agencies. The role fulfilled by the agro-chemical companies in this

respect relates to aspects of pesticide management described above, including recycling and assistance with application. In relation to other government agencies 'other' roles related to the regulation of aspects of pesticide control including residue testing and regulation of veterinary pesticides. Other government agencies were also associated with inspection and enforcement.

Table 5.2 Co-occurrence matrix: Role of third party x Type of third party

	Agro-chemical company	Government agency	NGO	Other third party	Pesticide retailer	Private sector body	Producers Association
Collaborating with education and training	2	0	0	0	0	0	0
Disseminating information	1	1	1	1	0	0	2
Inspection/ enforcement	0	4	0	0	1	0	0
Other third party role	6	4	0	0	0	2	1
Providing advice	2	3	0	1	4	0	2
Various	0	1	0	0	0	1	0

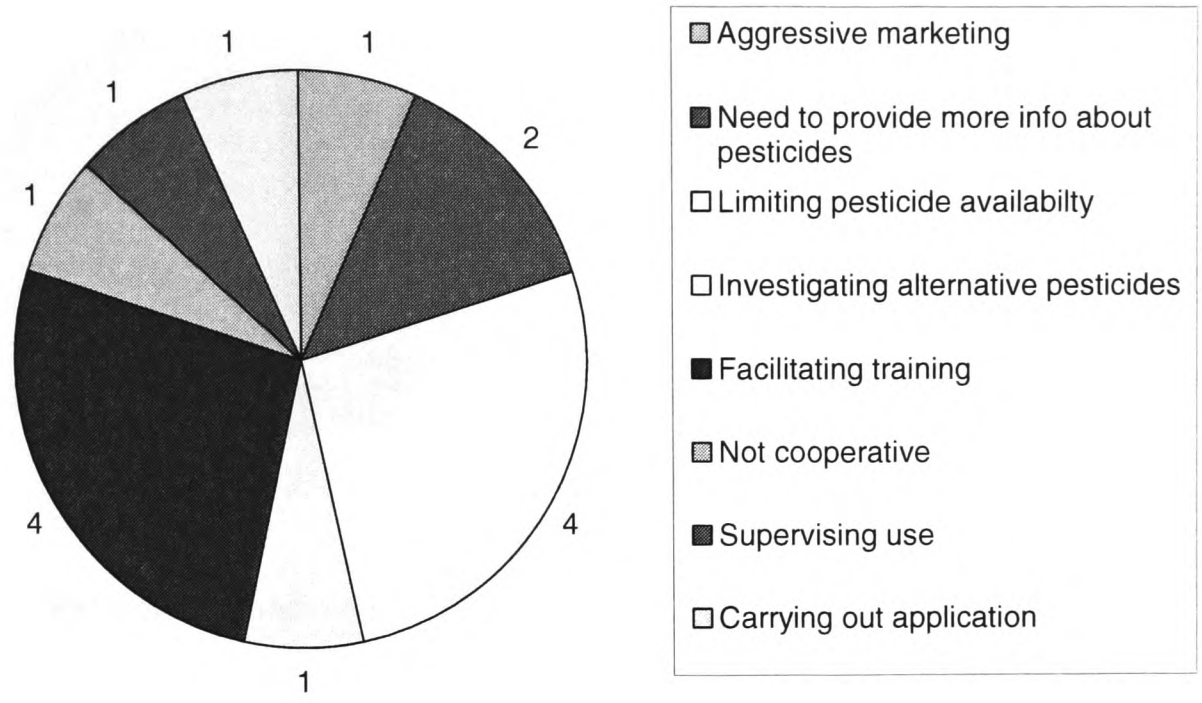


Figure 5.36: Perceptions of the agro-chemical industry (totals)

Perceptions of, and experiences with, the agro-chemical industry can be seen in Figure 5.36, above (some negative perceptions related to the industry can also be seen in Figures 5.9 and 5.10). Responses are mixed. There is some recognition of the practical contribution of the industry: four interviewees identified the companies as playing a role in facilitating training in some way and assistance with pesticide application and the supervision of pesticide use were each recognised in one instance. Four interviewees considered, however, that the agro-chemical companies are limiting the availability of pesticides and other responses indicated that stakeholders consider the companies to be uncooperative in relation to pesticides control. These responses included a perceived need for those companies to provide more information about pesticides (guidelines for use and technical data).

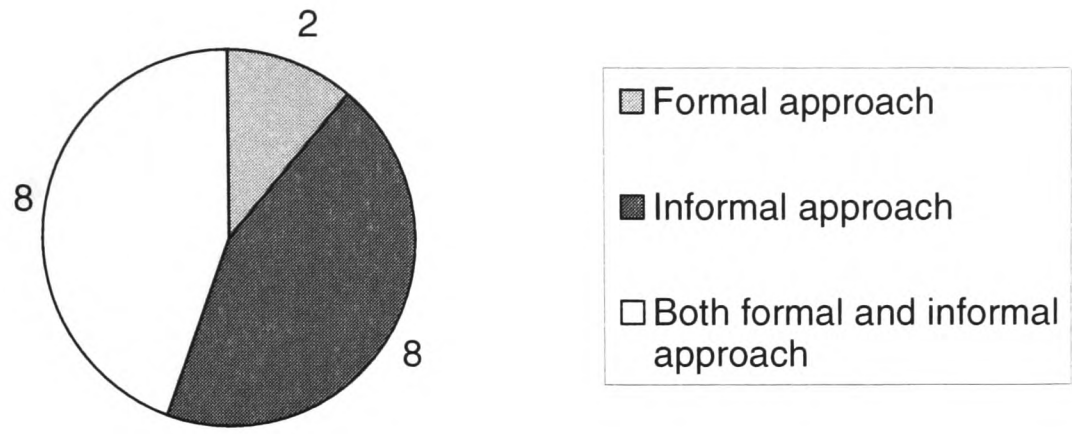


Figure 5.37: Perceived approach of PCB to enforcement (overall totals)

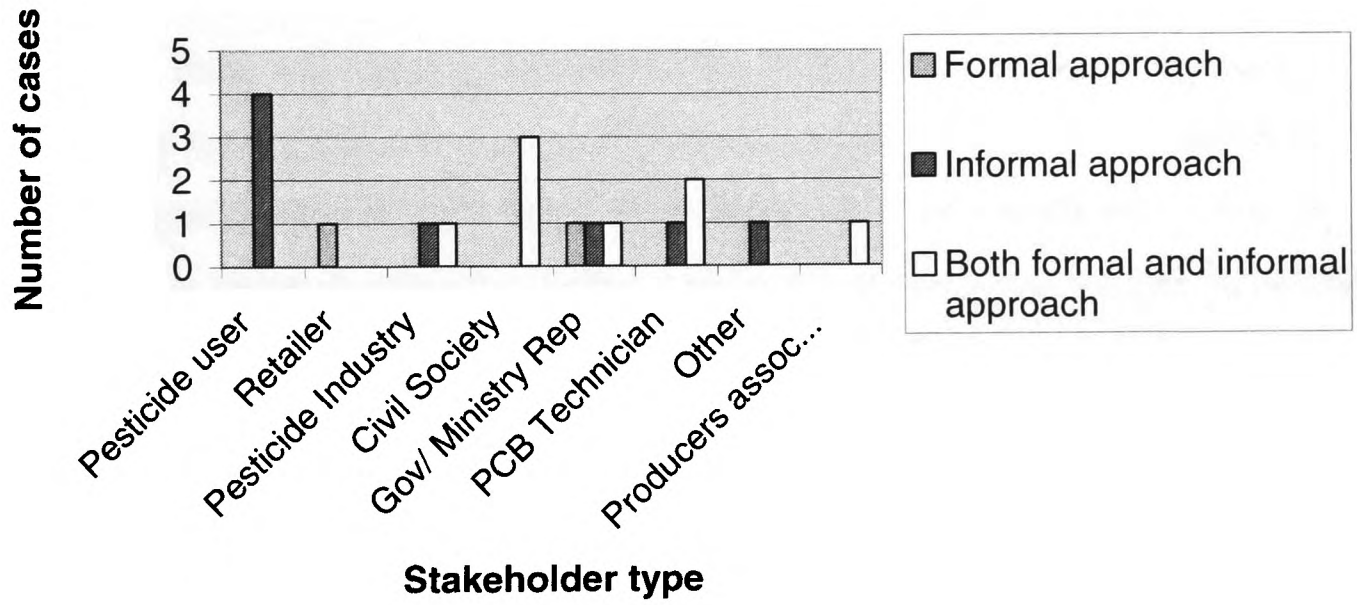


Figure 5.38: Perceived approach of PCB to enforcement (by stakeholder type)

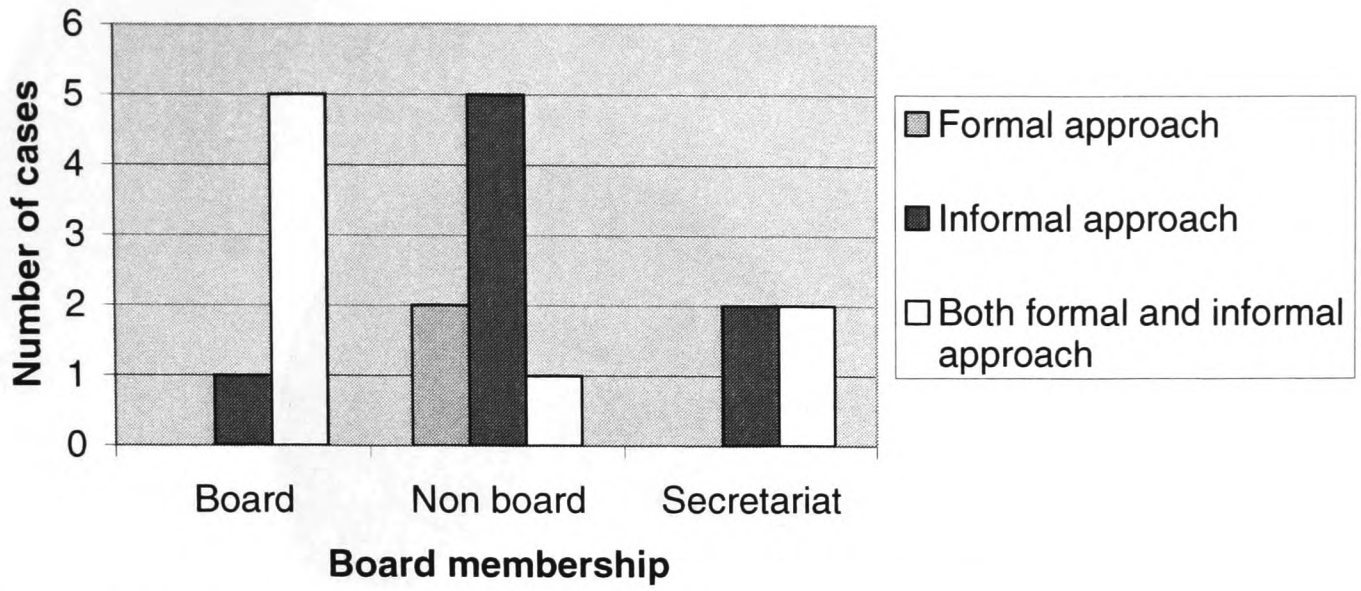


Figure 5.39: Perceived approach of PCB to enforcement (by Board membership status)

Coded perceptions relating to the approach of the PCB to enforcement can be seen in Figures 5.37–5.39. It can be seen that of those cases in which such a perception was coded, there was equal recognition of the PCB taking an informal approach and of them taking both a formal and informal approach. Both of these response types were recognised in eight of the 18 cases in which a response was coded, or 44% of those cases. A primarily formal approach was recognised in just two of the 18 cases, or 11% of those cases. At the stakeholder level (Figure 5.38) it can be seen that all of the coded responses for pesticide users and 'other' stakeholders indicated that informal perceptions of the approach to enforcement are held, while all those coded for pesticide retailers indicated a formal perception of the approach being held. Amongst the other stakeholder types there was a mixed recognition of the approach. The predominant perception of Board members was that there is both a formal and informal approach. The predominant perception of non-board members was that the approach is informal while the perceptions of the Secretariat were split equally between an informal and both a formal and informal approach.

The identified approach to pesticides control, in overall terms, has been seen in Figures 5.1–5.3. The types of contact that pesticide users identified having with the PCB are presented in Figure 5.18.

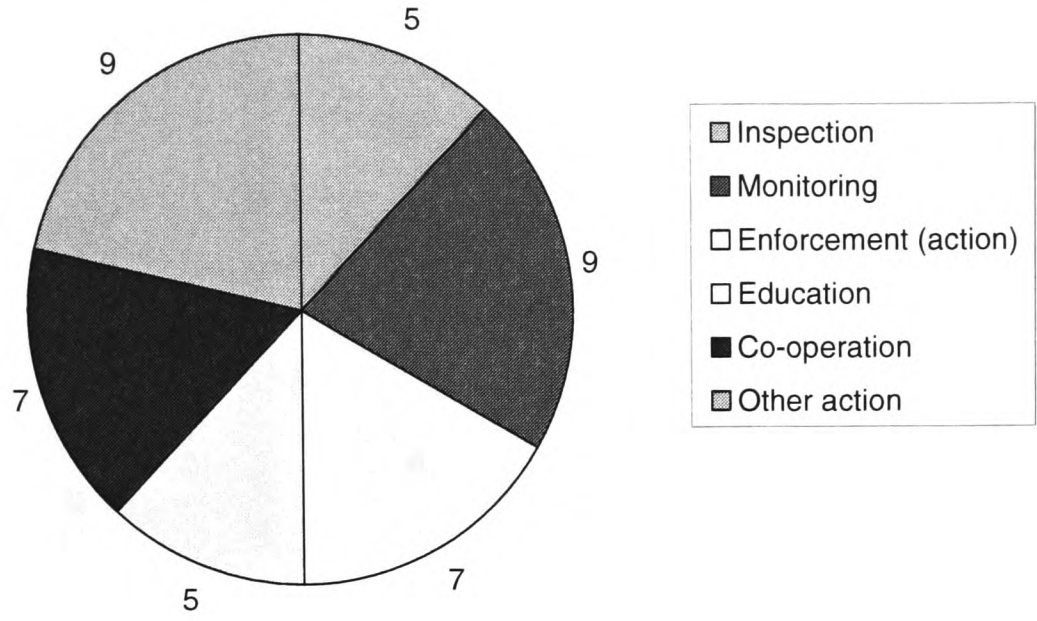


Figure 5.40: Identified enforcement action (overall totals)

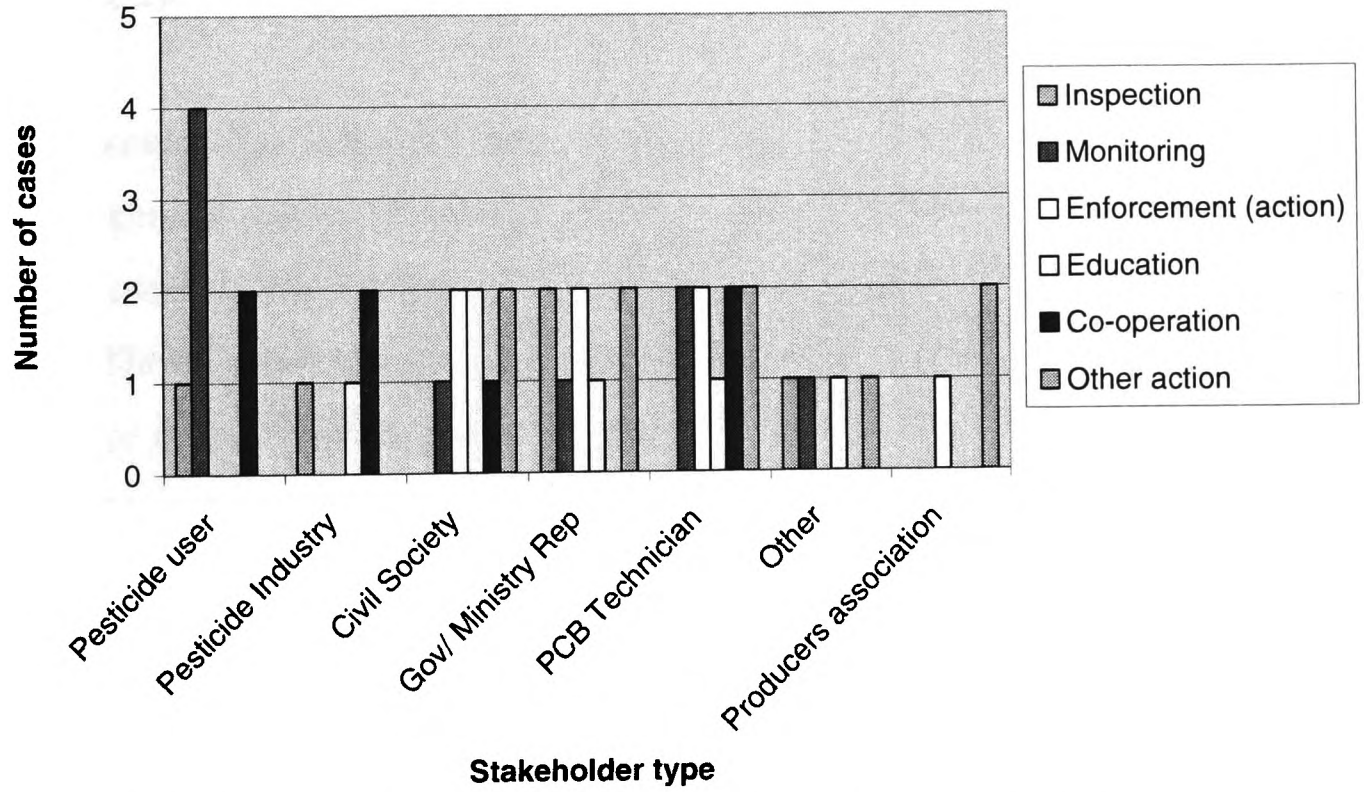


Figure 5.41: Identified enforcement action (by stakeholder type)

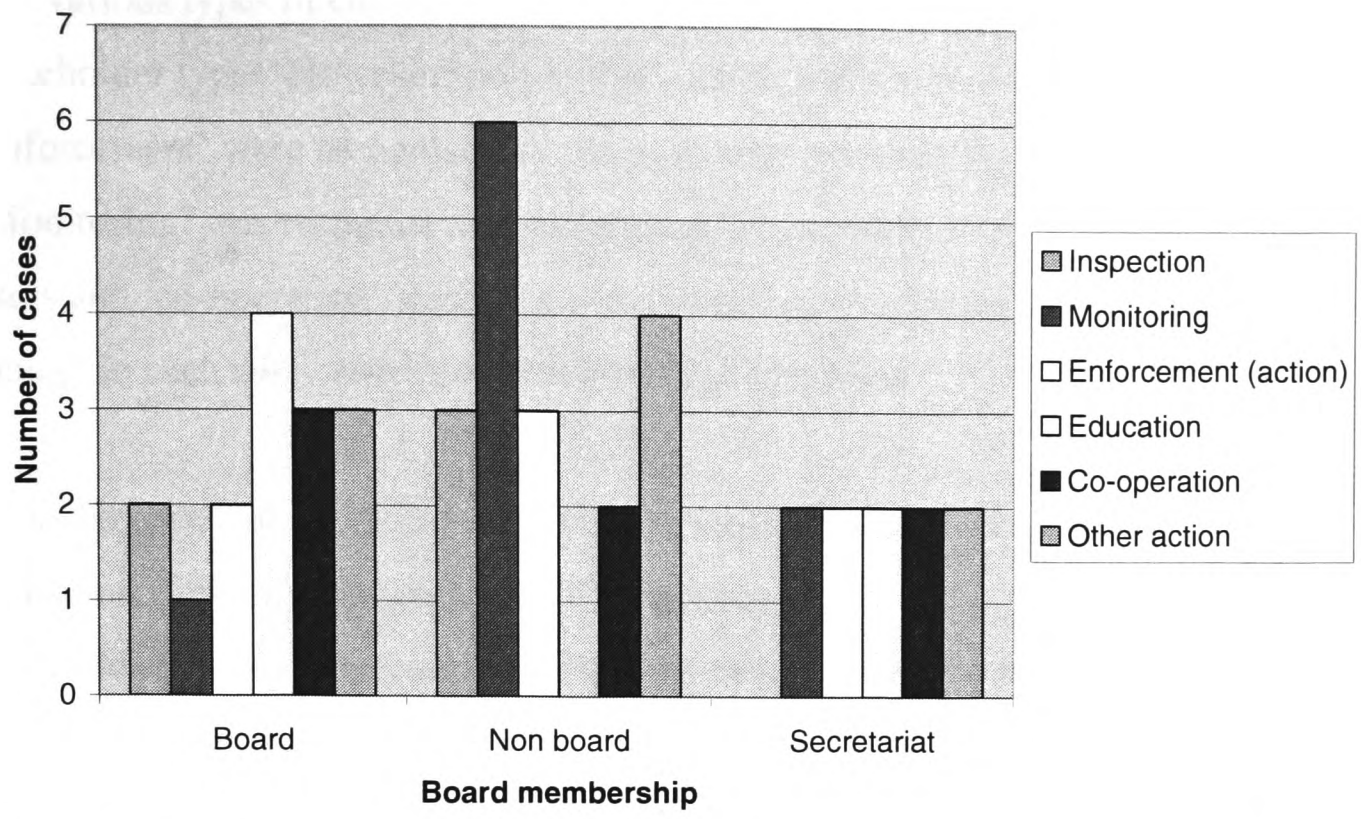


Figure 5.42: Identified enforcement action (by board membership status)

The findings in Figures 5.40–5.42 indicate the type of action that stakeholders consider is taken in instances of enforcement. Codes were applied by incident so that each interviewee may have indicated more than one type of action.

There is only slight variation between the frequencies of recognition of each type of enforcement action. The most commonly coded actions were 'monitoring' and 'other action' each constituting 21% of the total responses identifying enforcement action. These 'other' actions are primarily the confiscation of chemicals and the issuing of fines.[424] In one case it was noted that a warning was given and in another case, similarly, the giving of notice that the law was being broken was referred to. Less formal enforcement actions were equally important; 'education' was identified as an enforcement action in five cases and 'co-operation' was identified in seven cases.

[424] In two cases in which confiscation was identified as an enforcement action responses indicated that this would be undertaken by quarantine inspectors (working for the Belize Agricultural Health Authority), rather than by PCB technicians. Under the present arrangement these quarantine inspectors have responsibility for enforcement of the importation of pesticides at border entry points.

The various types of enforcement action were recognised by the different stakeholder types. However, only 'other' action and action generally referred to as 'enforcement' were recognised by the producers association representatives. 'Monitoring' was recognised more frequently than other activities by pesticide users and 'co-operation' was the most common action for the pesticides industry, though in each case other activities were also identified.

It can be seen that for Board members the most frequently identified activity was education (identified in four cases) followed by 'other action' and 'co-operation', (each identified in three cases). Non-board members most commonly identified the enforcement action 'monitoring' (identified in six cases), followed by 'other' action, (identified in four cases).

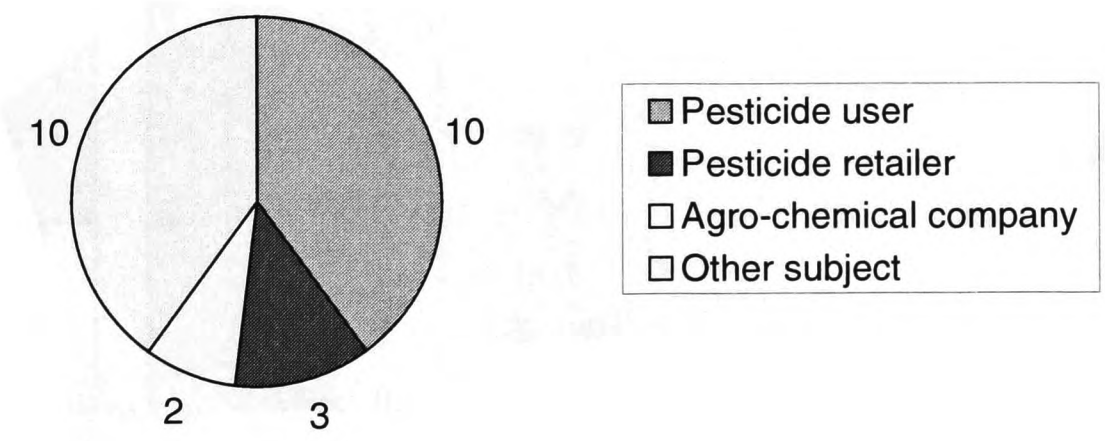


Figure 5.43: Identified subject of enforcement action (overall totals)

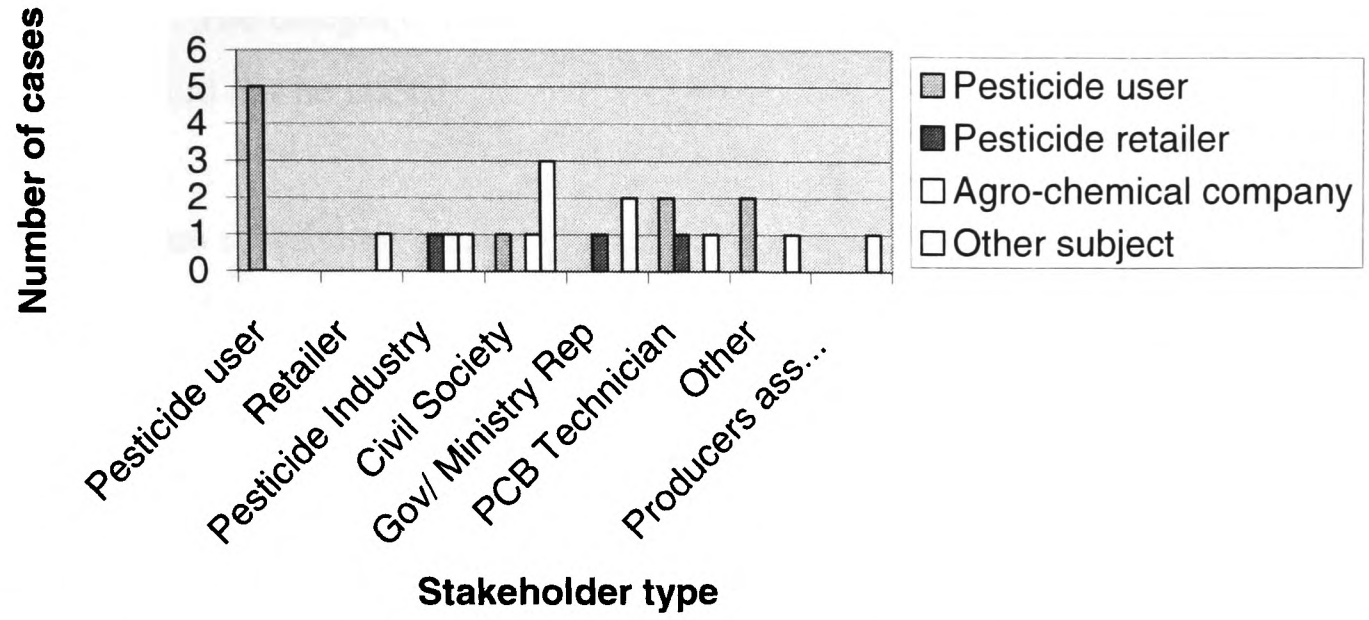


Figure 5.44: Identified subject of enforcement action (by stakeholder type)

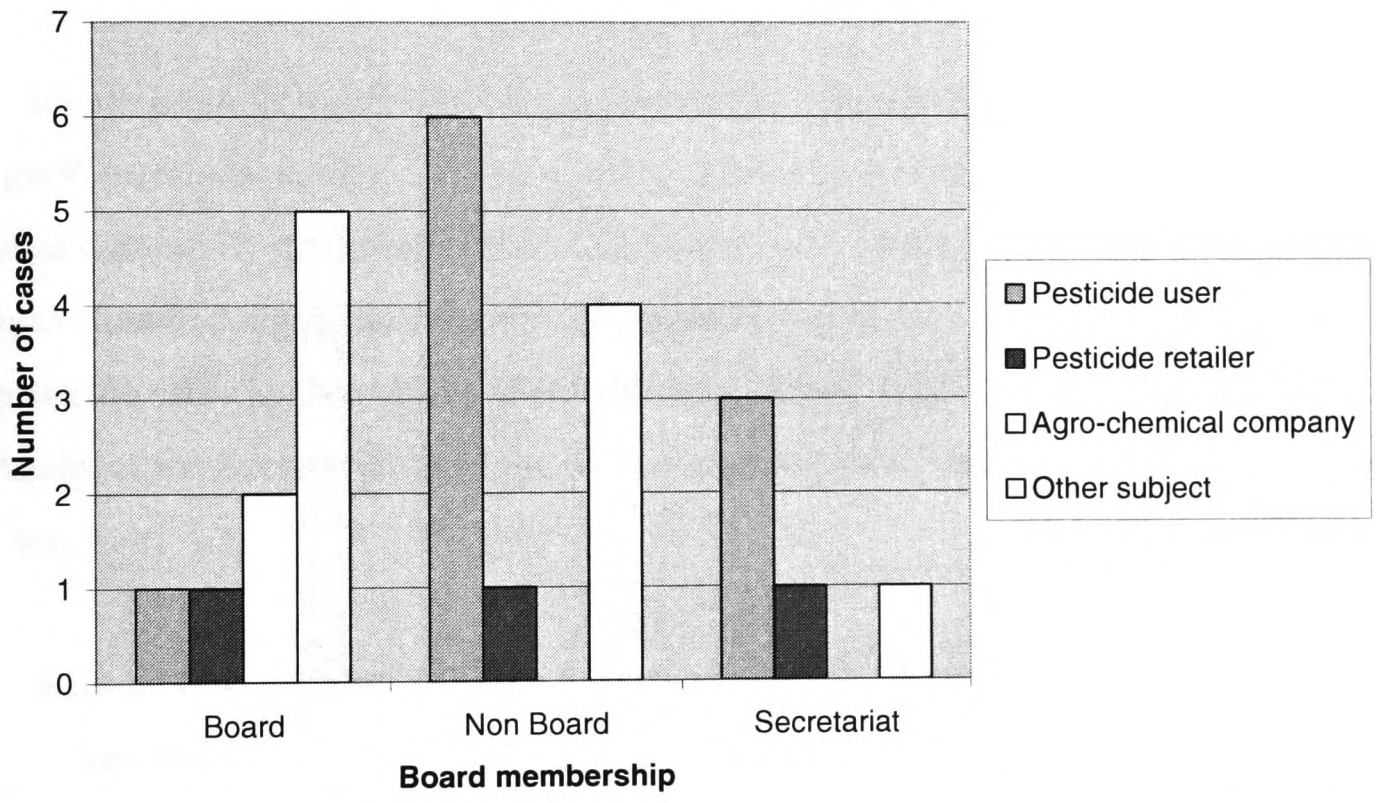


Figure 5.45: Identified subject of enforcement (by Board membership status)

Figures 5.43–5.45 indicate the subject of the enforcement action identified in Figures 5.40–5.42, or of action that has been or would be taken, as identified by the stakeholders. The subjects most commonly identified are both pesticide users and 'other'; both of these were identified in 10 of the 25 coded responses, or 40% each of those responses. These 'other' subjects were often the importers of pesticides, including large scale and individual importers, though often there was not a clear distinction and it was therefore not appropriate to code the subject more

specifically. The category 'other' also includes general references where specific subjects could not be coded.

It can be seen that there is some variation in the identification of the subjects of enforcement by stakeholder type. Perhaps it would be expected that pesticide users most commonly identified themselves or other pesticide users as the subjects of enforcement action as they generally discussed their own experiences. Pesticide users were also the subjects most commonly identified by the PCB technicians and by 'other' stakeholders. 'Other' subjects were important amongst other stakeholder types and were the subjects most commonly identified by pesticide retailers, civil society, government representatives and producers associations.

Pesticide users were less frequently identified as the subject of enforcement by Board members, compared with non-board members. 'Other' subjects were the most commonly identified enforcement subjects for Board members, followed by agro-chemical companies. Non-board members most commonly identified pesticide users as the subject of enforcement action, followed by 'other' subjects. Again, at the Secretariat level the most commonly identified subject was pesticide users.

The co-occurrence matrix (Table 5.3) illustrates the frequency with which coded references to the type of enforcement activity co-occur with coded references to the subject type of that activity. It should again be remembered that co-occurrence is based on the frequency with which two codes are applied to the same piece of text (response), by instance, and not by case occurrence. For this reason there may be a small margin of error since, for example, an activity may be associated with one subject but in a piece of text in which two different subjects are identified. In this case the activity will apply to both subjects for the purpose of co-occurrence frequencies. Instances of this were rare.

It can be seen that pesticide users are most commonly referred to with the enforcement activity 'monitoring'. Monitoring was associated with pesticide users

in 11 of the 20 references where the coded subject of enforcement action was pesticide user. References to the enforcement activity taken in relation to pesticide retailers were distributed more evenly and included monitoring, inspection and enforcement generally. Similarly, the activity associated with 'other' subjects was varied and included the various coded activities. Agro-chemical companies were associated with co-operation and education.

Table 5.3 Co-occurrence Matrix: Type of enforcement activity x Subject of enforcement activity

	Agro-chemical company	Other subject	Pesticide retailer	Pesticide user
Co-operation	2	3	0	3
Education	2	3	0	2
Enforcement (action)	0	2	1	2
Inspection	0	2	1	1
Monitoring	0	2	2	11
Other action	0	5	0	1

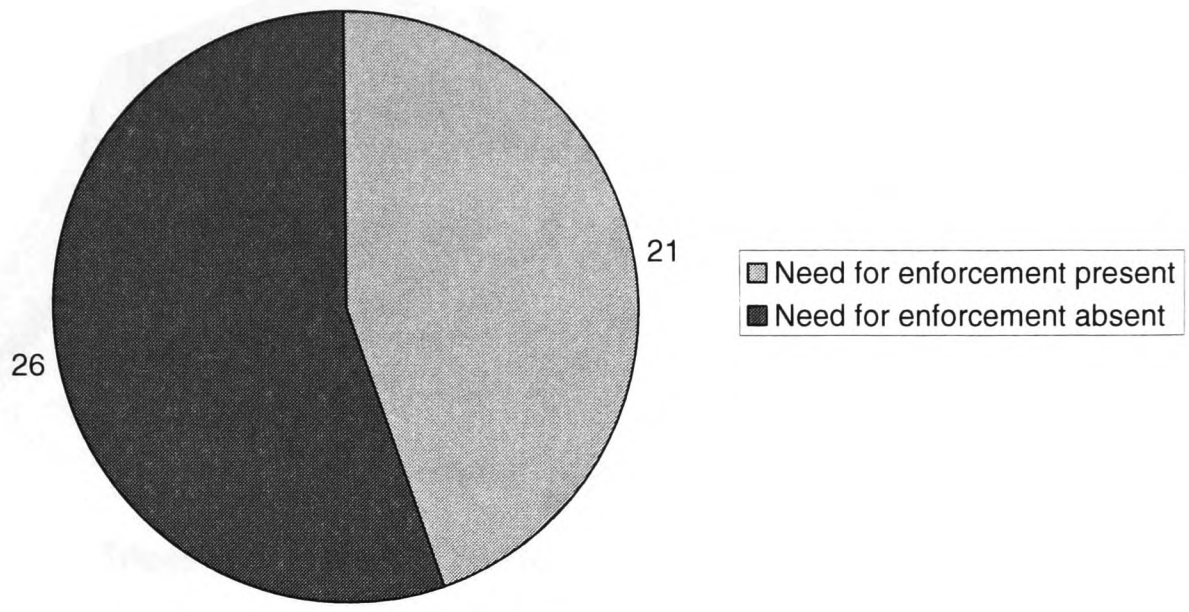


Figure 5.46: Identified need for enforcement (total cases)

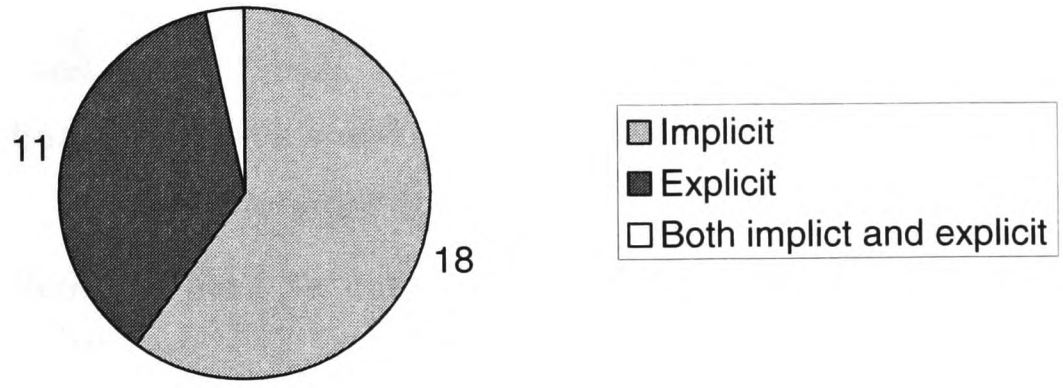


Figure 5.47: Identified need for enforcement (reference type) (overall totals)

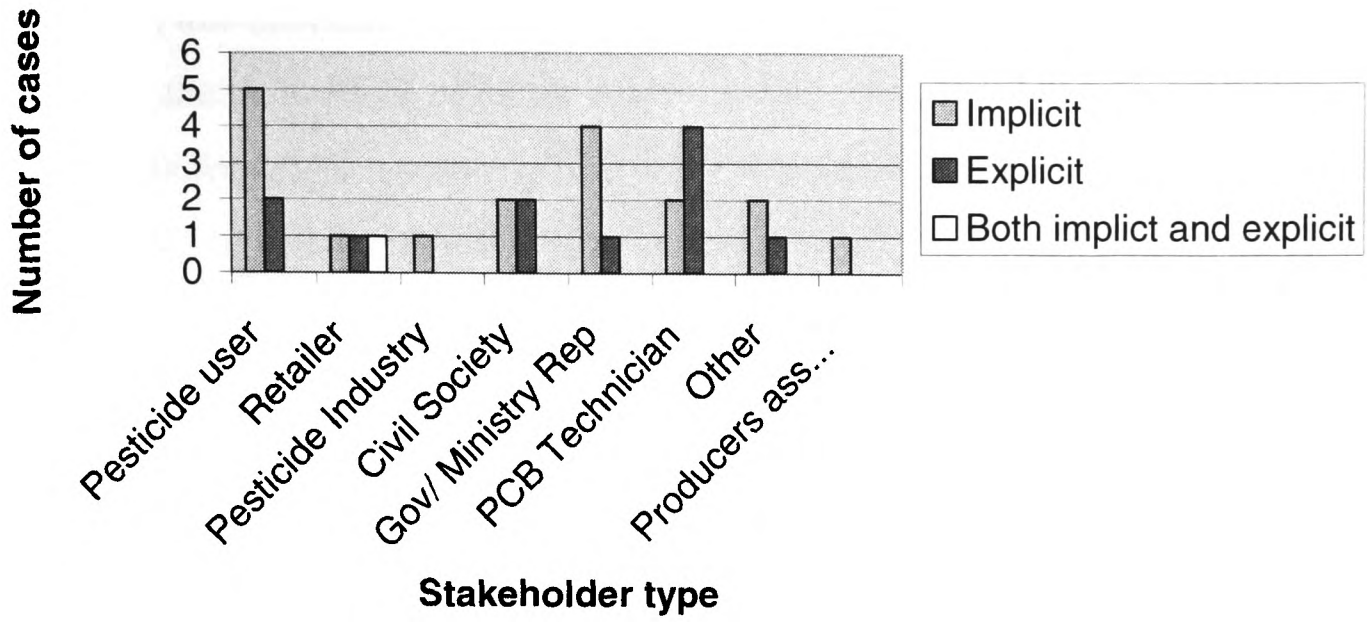


Figure 5.48: Identified need for enforcement (reference type) (by stakeholder type)

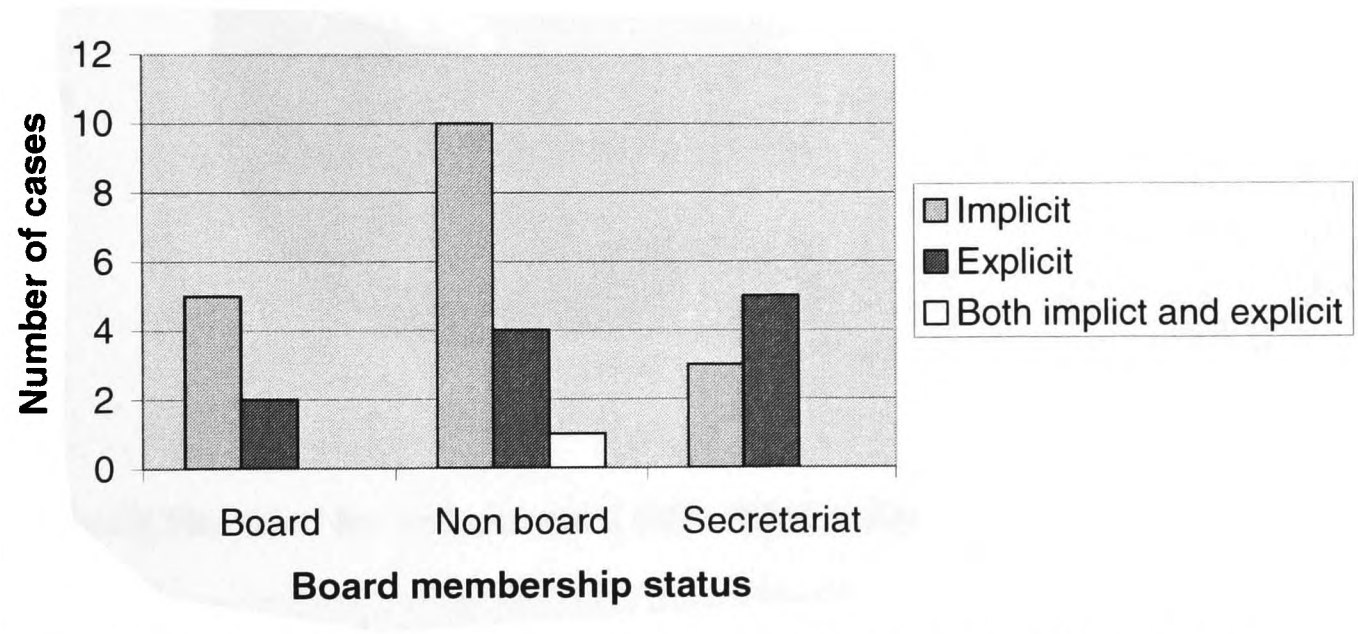


Figure 5.49: Identified need for enforcement (reference type) (by Board membership status)

Some negative perceptions and problems related to a lack of enforcement have been seen in Figures 5.9, 5.10 and 5.28. When coded specifically, the need for an increase in enforcement was identified in 45% of all cases. In the majority of those cases reference to the need for increased enforcement was implicit rather than explicit. An implicit need for enforcement was identified in 18 cases (60% of cases identifying a need for increased enforcement), with an explicit need for enforcement identified in 11 cases (37%). One case identified the need for increased enforcement in both implicit and explicit terms.

Generally, this distribution was reflected in the results by stakeholder type. However, the majority of pesticide control technicians explicitly identified the need for increased enforcement. This result was again reflected in terms of Board membership where the majority of references to the need for enforcement were implicit with the exception of perceptions of the Secretariat, for whom the majority of references were explicit.

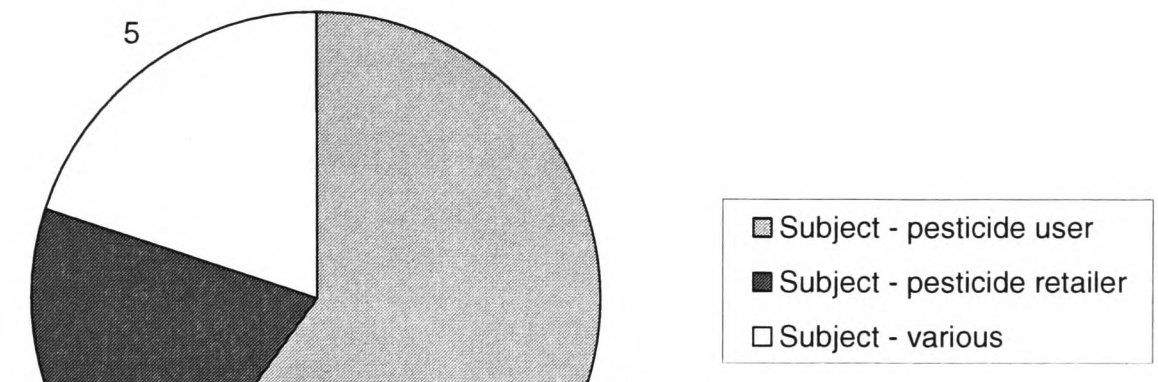


Figure 5.50: Need for enforcement (identified subject) (overall totals)

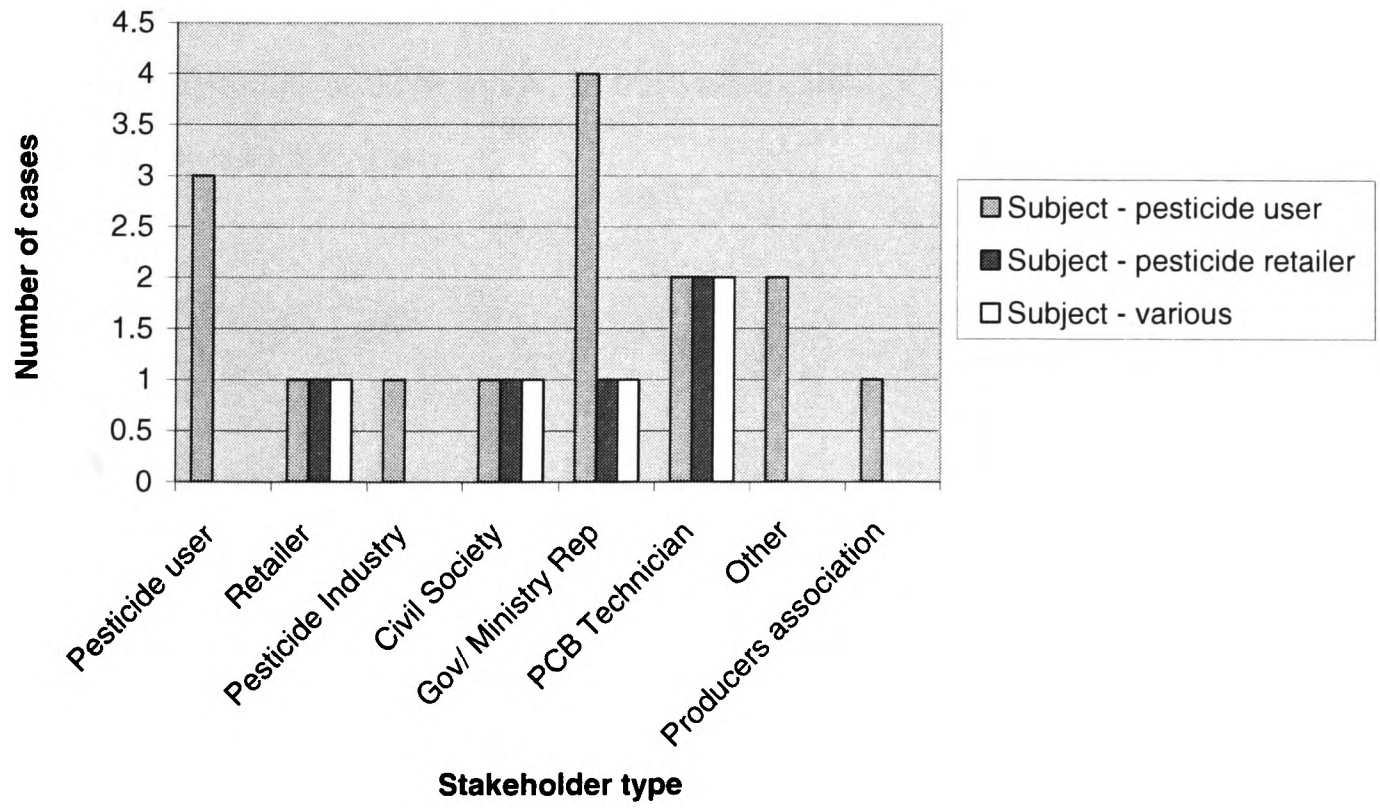


Figure 5.51: Need for enforcement (identified subject) (by stakeholder type)

Figures 5.50 and 5.51 show the identified subjects of enforcement associated with the need for enforcement seen in Figures 5.47–5.49. It can be seen that in the majority of cases, the subject of the enforcement perceived to be needed was the pesticide user, (identified in 60% of coded responses indicating the subject of the need for enforcement). Twenty percent of coded responses identified pesticide retailers as the subject of the needed enforcement. 'Various' subjects were also identified in 20% of cases, these were cases that referred either to both retailers and pesticide users or to a general need for enforcement.

Table 5.4 Co-occurrence matrix: need for enforcement (subject) x need for enforcement

	Both implicit and explicit	Explicit	Implicit
Subject: pesticide retailer	0	4	2
Subject: pesticide user	0	3	18
Subject: various	2	2	2

The co-occurrence matrix in Table 5.4 (illustrating the frequency of code co-occurrence, as discussed above at Table 5.3) indicates that where explicit references to the need for increased enforcement were made the proposed subject of that action varies, with a slightly higher number of explicit references relating to pesticide retailers. However, it can be seen that where implicit references to the need for enforcement were made, in the vast majority of cases the proposed subject was pesticide users.

5.2 FURTHER ANALYSIS AND DISCUSSION

5.2.1 The regulatory approach of the PCB

An important aspect of the findings is the perceptions of stakeholders concerning the regulatory approach of the PCB and the implications of this approach. It can be seen that the PCB has generally adopted an education-based, co-operative approach. Key components of this are the use of education and training tools and the approach taken by the PCB technicians. These various aspects of the PCB's approach appear to have facilitated positive outcomes and the PCB's regulatory approach can generally be considered to be a strength of the pesticides control framework.

It can be seen from the findings that the approach of the PCB to pesticides control, as identified by stakeholders, is rarely perceived in purely regulatory terms (Figure 5.1). Stakeholders predominantly perceive the PCB as taking both a regulatory and an educational approach, or often a solely educational approach, to pesticides control. In a response coded as identifying 'both a regulatory and educational' approach, a pesticide user describes having received advice from the PCB but also being subject to inspection: "*I think, well uh, they keep checking what, what you're gonna use the pesticide on... for what purpose you need it. Cos sometime you go up there and they, they will recommend the, the rightful pesticide for you to use in the field, sometimes they will tell you that*", the stakeholder also comments

> " Stakeholder:*...Usually I go and ask them uh I go and explain to them you know I have some problem with some kind of ( ) in my field...that I can't get rid of and uh, I would explain to them what has happened and they would tell me what pesticide I could use on that. And how to use it.*
>
> Interviewer: *Oh ok. Have you ever had any inspections around your...?*
>
> Stakeholder: *Oh yeah, several times they go around and they go checking see, uh, what's, what's wrong in the field, what's, how, how you're running your field and they would tell you 'you need this, you need that*"[425].

[425] PCB interview 34

In a response coded as 'educational approach' one civil society representative considers that "*they invest a lot of, I think about more than fifty percent of their time in, in training, and probably even financial resources in the training*"[426]. A member of the pesticides industry, also a Board member, also comments, "*The approach has never been an enforcement thing it has been an educational thing and then the enforcement comes as part of it ( ) last*"[427]. The perception of the PCB, therefore, is not simply that of a formal, regulatory body, existing to impose and enforce the law, but is also of a body that exists to educate stakeholders.

This educational approach is evidenced by the types of interaction that the PCB has with stakeholders. An important focus of the PCB's approach has been on co-operation between the regulator (the PCB) and the regulated community and the provision of assistance and education by the PCB to those regulated stakeholders. Pesticide users are likely to have had contact with the PCB which focuses on assisting and protecting the pesticide user (see Figure 5.18). This is achieved primarily through the training and education of pesticide users, as well as through other service-based activities, and is likely to involve minimal reliance on enforcement, particularly formal and/or sanction-based enforcement (see Figure 5.18, Table 5.1 and Figure 5.40). Other types of stakeholder have also been subject to this co-operative and educational approach. Members of the general public may have been exposed to educational materials, such as leaflets and posters, produced by the PCB. The PCB also involves other relevant bodies, primarily through their representation on the Board of Directors. In this respect the PCB, as a regulatory body, is able to 'reach' relevant persons and bodies and to enable them to be involved with, and aware of, the pesticides control framework. Although this contact is not primarily assistance-based, it does allow relevant stakeholders to be directly involved with pesticides control and therefore to be aware of the legislative and policy measures that are taken.

The type of interaction that the PCB has with stakeholders may influence the way that the PCB is perceived. It can be seen that there is an almost equal recognition

---

[426] PCB interview 5

of the PCB being a service-based agency as there is of it being a control-based agency (Figure 5.4). The responses indicating that the PCB is a service-based agency generally identify the PCB as existing to educate and assist the regulated community, particularly the pesticide user. For example, one PCB technician comments, "*The purpose of pesticide - first thing, my opinion is safety... Safety for people like who are using the pesticide and safety for the environment...That's, that's the whole purpose, educational, we educate the people...On safe, you know, how to use the chemicals and what are the disadvantages of not protecting yourself*"[428]. The findings indicate that pesticide users perceive the PCB as a service-based agency, as opposed to a control-based agency more commonly than other stakeholder types (Figure 5.5).

Perceptions of the PCB as a more control-based agency might be explained by the different type of interaction that the PCB has with stakeholders other than pesticide users. In cases in which the PCB is perceived to be control-based, stakeholders view the PCB in more formal terms and consider that it exists to regulate and control pesticides and to enforce those regulations, for example, "*I believe the main role should be to um to regulate the use of agro-chemicals or pesticides, uh, in the sense that there is no abuse, that um, we're using what is required to be used*"[429].

Stakeholders who are not pesticide users, (and to some extent pesticide retailers, who will also be subject to regulation by the PCB), although still subject to the co-operative approach of the PCB, are likely to perceive and encounter the PCB in different contexts. Stakeholders such as government or civil society representatives may perceive the PCB in more formal and control-based terms because they are aware of the overall purpose and objectives of the PCB and are less involved with day-to-day interaction with them. Similarly, those who are Board members will be aware of decisions that are made at the formal, policy level but not necessarily with the actual implementation of these. For these

---

[427] PCB interview 6
[428] PCB interview 38
[429] PCB interview 3

stakeholders the PCB exists to carry out particular functions and is required to fulfil its mandate. Though in practice this may involve the use of assistance-based or service-based activities, the overall perception of the PCB is in terms of its regulatory functions. Pesticide retailers (and also the agro-chemical companies, though these are, of course, also Board members), are also likely to have some more formal contact with the PCB since they will be less involved with the education-based activities directed at pesticide users, for example (though they may still receive some advice and education from the PCB). It appears that greater levels of interaction, particularly where this is education-based, are associated with less formal (more service-based) perceptions of the PCB.

Training and educational activities have formed an important core of the work carried out by the PCB. At the centre of these activities is the training carried out by the PCB technicians with pesticide users, primarily farmers, to enable those users to obtain a certified user licence (a licence to purchase restricted pesticides). These types of activities were introduced in the early stages of implementation and remain as some of the principal activities of the PCB. Other training and educational activities are carried out, including education in schools and in wider user groups, such as women's groups[430] as well as through the provision of educational materials, as mentioned above. The extent to which pesticide users have been involved in these types of activities appears to be high (see Figure 5.18) and the findings indicate that stakeholders clearly support both training and educational activities (Figures 5.21 and 5.22; see also Figure 5.11). There is also a perceived need to increase the frequency of these activities. Of the 25 interviewees identifying a need to increase the frequency with which the PCB carries out activities, 15 of these referred specifically to training and education (Figure 5.23). Several other interviewees indicated a need for an increase in the frequency of farm visits and other assistance from the PCB. These relate to training and education more generally. These perceptions appear to encourage the expansion of this aspect of the PCB's work.

[430] PCB interview 18 (PCB technician)

One beneficial outcome of the educational approach adopted by the PCB is an understanding of the purposes of pesticides control. It has been seen that stakeholders generally demonstrated a good level of awareness of the purpose of controlling pesticides (Figure 5.12). Amongst pesticide users, 13 of the 18 interviewees, or 72%, identified the purpose of pesticide control in terms of health and safety and/or environmental protection. The training and education activities which pesticide users in particular have been exposed to have focused on the reasons why pesticides are controlled as well as how they should be controlled. This direct interaction between the PCB and the regulated community appears, based on these findings, to facilitate an understanding on the part of pesticide users of the purpose of pesticide control. More general educational activities and interaction, particularly public awareness campaigns, are likely to have contributed to the high levels of awareness demonstrated by other stakeholder groups. The availability of this information and a focus on educating stakeholders might be assumed to facilitate high levels of awareness and it appears that this has been achieved in practice.

The approach of the PCB appears to be associated with another positive outcome, namely a high degree of support for the regulatory agency and the controls that are in place. It can be seen that positive perceptions of the PCB are much more common than negative perceptions (see Figures 5.7–5.9). These positive perceptions relate to the scope of activities, the effectiveness of the PCB, in terms of the operations of the Board and the Secretariat and to the impact of the pesticides control framework generally. These issues were also recognised in the identified strengths of the PCB, while weaknesses primarily related to the availability of resources and financial sustainability (Figures 5.10 and 5.11). It appears that stakeholders, on the whole, are highly positive about the PCB and support their role and activities. Negative perceptions seldom indicated problems of a lack of support for these activities or negative perceptions of the technicians or the objectives and activities of the PCB generally. There also appears to be a good level of support amongst stakeholders for the legislative controls that are in place, with few, if any, perceptions indicating resistance towards the controls (see

Figures 5.13 and 5.14). Awareness of, and apparent compliance with, particular pesticide control measures is (self-reported) to be high (Figures 5.19 and 5.20). Many stakeholders also consider that there is a need to increase the frequency and scope of activities carried out by the PCB (see Figures 5.23–5.26), suggesting that these are well supported.

These perceptions and responses indicate that stakeholders support the work of the PCB and, in fact, encourage it. The PCB, through its interaction with stakeholders, has enabled a situation in which stakeholders are aware of and support the agency itself and its objectives. In such a situation, compliance on the part of the regulated community should be easier to obtain since stakeholders, particularly pesticide retailers and users, are aware of why particular practices should be carried out and how these practices can be achieved. Stakeholders do not appear to feel threatened by the PCB or generally to identify confrontational situations. Rather, they feel that the PCB is doing a good job, support the purpose for which that job is being undertaken and would like to see more of the same type of work being carried out. In this climate non-compliance because of malice towards the regulatory agency or ignorance of the regulations is likely to be minimised. The coded responses indicate that many stakeholders consider that the main function, or one of the main functions, of the PCB is to protect pesticide users and also the consumer population more generally. This perception, along with positive attitudes outlined above, should also facilitate compliance since the willingness of pesticide users to implement the practices that are taught by the PCB is likely to be increased when pesticide users feel that the implementation is for their own benefit.

The pesticide control technicians are responsible for carrying out the training and education of the regulated community and are also responsible for undertaking farm visits, for the purpose of enforcement or otherwise (as well as other regulatory activities). The findings suggest that these activities are well supported by stakeholders including the regulated community. Since the technicians are responsible for carrying out these activities it may be considered that they are largely responsible for this level of support.

The support for the technicians and their activities can be attributed, at least in part, to the approach of the technicians themselves. The data indicates that the majority of stakeholders have an informal perception of the technicians (see Figure 5.15–5.17), viewing them as advisors and as persons there to assist pesticide users and other stakeholders in achieving safe pesticide use. One stakeholder, for example comments, "*We feel like they have help us a lot and, and that's why we um, {PCB technician name} is here, like I say, at least once a week and we don't call him 'this guy from pesticide' we call him by his first name, he's our friend, we take him wherever we're applying pesticides, he can go with us and...We feel very comfortable with him*"[431]. Because much of the work that the technicians carry out is assistance or education based (see Figure 5.18), the PCB technicians are not seen simply as authoritative figures, there to apply the law but rather, stakeholders consider that the technician's role is to work with pesticide stakeholders, particularly users, to enable them to comply with the regulations. Another stakeholder comments, "*I guess we have good contact with PCB and ( ) working along, even working together and {technician name} has helped us a lot in training people. I think they're doing good, no?*"[432] It has been seen that a number of positive perceptions were related to the PCB technicians. No real problems with the technicians were identified by stakeholders (See Figures 5.7–5.11) and, taken with the other positive perceptions and informal perceptions of the technicians, it appears that positive working relationships exist between the technicians and other stakeholders including the regulated community.

The informal perception of technicians combined with the assistance-based approach of the PCB appears to facilitate further co-operation from stakeholders. Having an identifiable and co-operative point of contact (usually established through training) that stakeholders feel positively towards means that pesticide users and farm managers may be more willing to seek advice from the PCB. It can be seen that seven of the 18 interviewed pesticide users indicated that they had sought and/or received advice from the PCB (see Figure 5.18). This in turn should enable greater levels of compliance. Since stakeholders feel that the technicians

[431] PCB interview 21

are assisting and helping them, it may be easier to facilitate a change in user practices in instances of non-compliance or lack of compliance, since the regulated community may feel less defensive or hostile towards the technicians.

It can also be seen that the approach of the technicians has contributed to the positive working relationship between stakeholders and the PCB: several of the identified positive aspects and strengths of the PCB related to the ability and attitude of the PCB staff (see Figures 5.8 and 5.11). A more formal approach could be counter-productive since the positive relationship and support for pesticide controls that currently exists may be lost if the technicians were to be viewed as adversaries. However, the findings indicate that there may be difficulties where this informal and advisory approach is extended to enforcement (see section 5.2.2).

The findings indicate that while some stakeholders do recognise the regulatory nature of the PCB, the predominant view is that the PCB takes an education-based approach (Figures 5.1–5.3). Stakeholders, including pesticide users, consider that the PCB is there not just to regulate but to assist and educate the pesticide user.

The informal perceptions of the PCB held by stakeholders, and the involvement of pesticide users in training and education activities, appear to have facilitated high levels of support for, and positive perceptions of, the pesticide control framework and the PCB. The regulatory approach, including the use of training and educational activities, is also associated with the high levels of awareness of the purpose of regulating pesticides.

The level of personal contact with PCB technicians appears to be important for pesticide users. In identifying a need to increase the frequency of activities, as well as identifying specifically a need to increase the frequency of training and/or education, eight pesticide users considered that there was a need to increase the frequency of farm visits (see Figure 5.24). Pesticide users appear to want to see more of the PCB at a personal level, either through training, education or farm

---

[432] PCB interview 39

visits. This indicates that there is a positive perception of the PCB and a positive relationship between the PCB and the pesticide users and this is facilitated by the assistance and education provided to the regulated community, including guidance on the purpose and methods of pesticide control that are the content of the training, and the overall co-operative approach that has been adopted.

5.2.2 The approach to, and extent of, enforcement

The findings indicate an identified need to increase the level of enforcement of the pesticide control legislation (see Figure 5.46). A lack of enforcement and/or weaknesses with the current approach to enforcement were also identified in a small number of cases as weaknesses (Figure 5.10) and 'ignoring violations' and 'not enforcing against Board members' were negative perceptions related to enforcement (Figure 5.9). Comments identifying a need for enforcement were both implicit and explicit (Figure 5.47). Aside from these references, the need for enforcement is identified in other aspects of the findings. As has been seen, one pesticide retailer commented that the agro-chemical industry puts pressure on the retailer to meet sales targets and this leads to a difficult situation for the retailer in requesting the certified user licence. Problems related to the implementation of the certified user licence, in terms of both the user trying to circumvent the licensing requirements and the retailers not requesting the licence, were identified in some interviews. Further to this, some problems related to the improper use of pesticides were identified (see Figures 5.28 and 5.29). These findings indicate that, despite the highly positive perceptions of the PCB, problems related to non-compliance remain. Although the approach to implementation of the PCA appears to have been a strength in achieving positive working relationships and high levels of awareness of the purpose of pesticides control and the requirements that are in place, some of these problems are yet to be addressed and indicate that an increase in the level of enforcement is perhaps needed.

It can be seen that there is an identified need for an increase in enforcement activity. In the majority of cases, however, the need for this increase is implicit rather than explicit.[433] In the majority of these implicit inferences the subject of the perceived need for enforcement is the pesticide user (see Figures 5.47–5.51 and

---

[433] The interviewee does not refer expressly to the need for 'enforcement' but does refer to this indirectly, such as to the need for actions which are in fact enforcement activities, as the following interview extract demonstrates: "*Um, aside from that, when it, when it uh in regards to some uh, the pesticides of more concern, we're looking at the class one a, class one b pesticides, um, the priority there would be to ensure that, not only that the users are certified but that um, all aspects related to the handling of these pesticides be monitored closely, and um, and that any um*

Table 5.4). There appears to be reluctance, on the part of stakeholders generally, to formally associate enforcement with the pesticide user. Thus, stakeholders may comment on the need for more 'monitoring' or identify situations in which the use of illegal pesticides could be detected, for example through residue testing. One stakeholder comments, "*Um, the other priority would be to, to institute some uh, audits or controls to see if they're effective as far as, do baseline studies to see what's out there and whether their programs are effective, so that would be basically do some testing of uh, of you know...of, of commodities or to see where there's problems, try to identify some hot-spots or areas...*"[434]. Another comments, "*It needs to be continuous and there needs to be monitoring as well...yeah, so you do training and then you do follow-up visits to ensure that they're applying what they've been trained on*"[435]. The term 'monitoring' is often associated with pesticide users and is used to refer to situations in which pesticide control technicians visit the site of pesticide use to determine compliance with the pesticide control regulations. This is perceived as an informal activity or 'visit' but is, in reality, a type of inspection. However, in these cases stakeholders do not identify it as such. In relation to pesticide retailers there are more frequent explicit references to the need for enforcement.

This lack of association between the need for enforcement and the subject of enforcement can perhaps be associated with the PCB's overall approach to pesticides control. It can be seen that few stakeholders consider there to be a solely formal approach to enforcement (see Figure 5.37). Stakeholders instead perceive the approach to enforcement as being informal or both formal and informal. Often, identified enforcement activities were not sanction-based but were informal in nature (Figure 5.40). It can be seen that a variety of enforcement activities are perceived to be carried out against a variety of subjects (Table 5.3). The two most common subjects of enforcement, as identified by the stakeholders, are pesticide users and 'other' stakeholders, commonly meaning pesticide importers consisting of both individual users and agro-chemical companies (see Figures 5.43–5.45).

---

conditions that may result in um, some form of contamination be um, be addressed, be, be identified and addressed uh quickly through um constant close monitoring" (PCB interview 41).

[434] PCB interview 31

Pesticide users are most frequently associated with the enforcement action 'monitoring'. It appears from these findings that the informal and co-operative approach has, to a large extent, been carried through to the stage of enforcement. 'Monitoring' is an informal term and although essentially it refers to 'inspection' it was coded separately to indicate the different association on the part of the stakeholders

The association of 'monitoring' with enforcement against pesticide users indicates that stakeholders, including pesticide users and technicians, often do not perceive these activities in terms of formal enforcement. Again, the technicians are associated with educating and assisting pesticide users rather than with regulating them in a formal sense. For example, one pesticide user comments, "*Oh yeah we have a field officers that go around and uh, showing you the way to use pesticide and the amount and how to know, how you uh, to protect yourself from getting damaged no..? Usually they tell you 'well before you start you've got to put some rubber gloves*"[436]. One technician also refers to his activities in terms of monitoring, "*And then we monitor the, the, the uh, the places where they sell pesticides*"... "*I do a lot of monitoring and follow up with, with um, the use of protective gears, for the applicators no?*"[437] The association of enforcement activities with other stakeholder types is varied (Table 5.3) indicating that on some occasions the technicians do carry out enforcement on a more formal basis. Agro-chemical companies were associated with co-operation and education. The approach to pesticide retailers appears to be slightly more formal with inspection and enforcement being associated with these stakeholders as well as monitoring.

The difficulty arising from the technicians playing the dual-role of advisor and enforcer is that where positive and informal relationships have been established, with the regulated community, the technician may find it difficult to carry out enforcement. They may have a relationship with the pesticide user that is too informal for either the pesticide user or the technician himself to regard the

---

[435] PCB interview 15
[436] PCB interview 34
[437] PCB interview 22

technician with sufficient formality to allow that type of formal action to be carried out. One pesticide control technician articulated this concern, "*I think nobody right now would feel themselves capable of handling a case where it has to go with enforcement. I think probably they would even feel, feel afraid to do it...when it comes to legal action*"[438]. Alternatively, stakeholders may be less likely to implement recommended practices in situations where the technicians are regarded informally because they may feel that these recommendations (in fact regulations) are merely a source of advice, as opposed to mandatory legal requirements. Although half of the pesticide users interviewed identified 'law' as a source of pesticide control, in the majority of cases, pesticide users identified measures less formally as advice or requirements (see Figure 5.27). This does not necessarily indicate that pesticide users view the controls as discretionary or voluntary as opposed to mandatory (in fact many responses indicate that this is not the case) but the level of formality with which the technicians are perceived may have some affect on the level of formality associated with pesticide control measures. The positive relationship between the PCB and other stakeholders may increase the willingness and capacity of the regulated community to comply with the regulations but in situations where compliance is difficult, or at least more difficult than non-compliance, stakeholders may be less likely to comply if they do not perceive the regulations in a sufficiently formal way.

The co-operative and educational approach to implementation and enforcement means that there is, in some cases, an overlap between activities such as education, and enforcement. Some activities, such as monitoring, which are essentially an enforcement activity, are therefore perceived as a means of assistance. A problem with this is that it can lead to confusion for both the regulator and regulated. This can make enforcement more difficult and/or less effective: the subject of the enforcement action may not regard the action in sufficiently formal terms for it to effect a change in the user's practices or the action may not be sufficiently 'visible' to enable it to be recognised by other stakeholders or to act as a deterrent. Stakeholders may, therefore, perceive a lack of enforcement where a lack of

[438] PCB interview 18

formality or use of sanctions or penalties is actually the problem. These perceptions may result both in lower levels of compliance and to the erosion of positive perceptions of the PCB. The present lack of an official enforcement policy may further exacerbate this.

The apparent success of the co-operative approach in other areas of pesticide control, particularly training and education, has perhaps led to reluctance, on the part of stakeholders, to recognise explicitly the need for formal or sanction-based enforcement. Since the overall approach, relying on education, assistance and co-operation appears to have led to an understanding, on the part of the regulated community and wider stakeholder population, of the purpose of pesticide control and a good level of support for those controls, it may be considered (by stakeholders) that enforcement at the formal level could adversely affect the positive outcomes that have been thus far achieved.

5.2.3 The role of the legislative framework and legal mechanisms in implementation and in achieving compliance

Perceptions of the legislative framework can indicate problems and successes in the pesticides control framework and the success or failure of particular legal mechanisms may be just as important as the means by which those laws are actually implemented. It has been seen that stakeholders understand the purpose of pesticide control but this understanding has been associated with the approach to implementation rather than the existence of the legislation itself. The proximity between the PCB and the regulated community and the activities undertaken in that context has facilitated an understanding of the purpose of pesticides control amongst the regulated community.

At the Board and Secretariat level, however, and in some instances for other ministry and government representatives, the legislation itself is important since a clear understanding of the scope and implications of that legislative framework will shape the implementation approach and future policies. The problems identified in Figures 5.13 and 5.14 relate primarily to the scope of legislative provisions, rather than to clarity or interpretation difficulties, with several stakeholders indicating a need to update the legislation to include areas of concern, These issues were identified by Board members and members of the Secretariat who are probably the stakeholders with the greatest knowledge of the content of legislation. However, the large majority of stakeholders indicate that the legislation has been 'sufficient so far'. This indicates that at the legislative level the law has been able to contribute effectively to the control of pesticides. It does not generally impede progress or action (as had been the case at some earlier phases of the legislation)[439]. Although there are no real problems, in this respect, for the regulated community, the findings suggest that there are limitations concerning the scope of the current legislative framework.

---

[439] Discussed in Black, 1999, op cit. See also Chapter 2 for discussion of the development of the framework.

The legislation as it now stands does have in place mechanisms for the implementation of less formal types of subsidiary legislation such as codes of practice. However, a problem with the legislative framework appears to be the actual use of these mechanisms. Though the current provisions are not causing any significant problems and are generally regarded positively, it has been seen that some particular areas remain in need of legislative provision. Although responses at the Board and Secretariat level indicate that progress is being made in these areas, some of the problems have been in existence for several years and this indicates that the actual mechanisms and means to introduce new provisions are a problem. In this case, the effective implementation of the pesticides control framework may be impeded. In some cases, for example, it was indicated that there was a need for guidance in particular areas of pesticide handling. A failure to provide that guidance may mean that compliance levels are lowered because the regulated community is unable to identify what it is that must be done in order to achieve compliance. Some of the problems most commonly identified are areas in which the introduction of subsidiary legislation was intended but in practice none has yet been introduced.

The findings indicate, however, that a lack of formal legislative provision will not necessarily prevent implementation of safe practices by the regulated community. The informal interaction between the regulated community and the PCB means that the emphasis has been on the practical requirements and the need for those measures rather than the status of the law in its own right. Through its interaction with stakeholders the PCB has been able to make pesticide users and other relevant stakeholders aware of recommended practices and pesticide control policies which have not yet received formal legal status. In two particular areas, pesticide users displayed a good level of awareness of recommended practices that in fact have not yet been formally implemented in regulations (or similar). See Figures 5.19 (storage practices) and 5.20 (container disposal practices).

Since pesticide users are generally positive towards the PCB, understand the purpose of pesticide control and display a good understanding of (certain)

recommended practices it can be seen that the existence of the law 'on the books' is not necessarily essential to the adoption of desired practices and knowledge. Of course, without these legal provisions the recommended practices, legislative controls and methods of implementation would not be in existence. At the user level in particular it can, however, be seen that the authority of a provision as law is less important than the contact that exists between the implementing body and the regulated person (though, of course, awareness and support is not necessarily the same as compliance). Nevertheless, the lack of legislative provision for some important areas of pesticides control presents a problem not least because this leaves the PCB in a position where it is unable to carry out enforcement action for failing to comply with these practices and controls. There is precedent, in the history of the pesticide control framework, for the introduction of Codes of Practice (CoPs) in a short space of time and with relative ease yet these remain lacking in the areas identified.[440] Without such controls it cannot be said that there is fully effective control of pesticides, at least in these areas.

As well as the interaction that takes place between the PCB and the pesticide users it can be seen that, for these stakeholders, a particular legal mechanism, the certified user licence, is commonly identified. Twelve of the 18 pesticide users identified the licence as a source of control (see Figure 5.27). This means that the users consider that particular provisions should/must be complied with because they are a requirement of the certified user licence. In obtaining the licence the users will undergo training and take an examination to signify that they are aware of, and have understood, the pesticides control regulations (though the provisions are not necessarily formally identified as such). The user licence appears to be something that the pesticide users tangibly associate with the formal pesticide control requirements. In this way it serves as an effective mechanism for implementation which bridges the gap, at least in some part, between the informal contact that the pesticide user has with the PCB and the formal requirements of the

[440] Black (1999, op cit.) has noted that despite the introduction, under the Pesticides Control Act, of legal authority for the adoption of CoPs, there was a reluctance, on the part of the Board of Directors to use this type of secondary legislation. SIs were considered favourable. This view may still prevail and would help to explain why this mechanism has not been utilised. See Black, 1999, op cit. pp. 27–28 and51.

law. The licence operates effectively this way because it is a practical enforcement device: pesticide users should always be required to show their licence when purchasing restricted pesticides and receipt of the licence indicates that the user may legally purchase, and apply, these pesticides. Since the purchase of these pesticides is important to the user, as a failure to do so could effectively have severe economic consequences, for example in terms of loss of yield, the pesticide users perhaps identify this in more formal terms than other measures. Similarly, the licence should lend formality to the status and actions of the PCB, since, theoretically at least, a failure to follow recommended (regulated) practices could lead to confiscation of the licence. Again this would be likely to affect adversely the pesticide user. Some pesticide control technicians indicate that pesticide users are not "bothered" about the certified user licence; that they do not see the need for it. In fact, no specific negative responses related to the user licence were identified (with the exception of one identified weakness concerning a lack of enforcement of the licence, see Figure 5.10). This indicates that the problem relates to the implementation of the licence, rather than to its function as an implementation mechanism. Pesticide users clearly identify pesticide control requirements with the licence and a lack of support in practice would suggest that, as considered by some stakeholders, users are not, in fact, being asked to produce the licence at the time of purchase. This means that the need to follow regulated practices could actually become irrelevant since users might not need the licence to purchase pesticides.

5.2.4 The role of third parties in the implementation and enforcement of the pesticides control framework

Third parties, in the context of pesticides control, are not external parties but are those stakeholders that play a role in the control and regulation of pesticides. Normally, this role is unofficial but is related to action taken by these third parties that does, in fact, contribute to attainment of the objectives of the PCA. A number of different third party types and roles have been identified (see Figures 5.30–5.35 and Table 5.2). Although none of the roles were identified by a majority of stakeholders, it can be seen that the frequency, overall, with which these are identified, indicates that their contribution to pesticide control is more than minor. Eleven interviewees identified third parties as playing an advisory role. A number of third parties fulfil the role of providing advice, particularly pesticide retailers and other government agencies. Eight interviewees identified 'other' third party roles, which primarily related to assistance with pesticide handling and management and also included residue testing and the allocation of medical facilities for intoxication incidents. The practical assistance identified under 'other' roles is associated with the agro-chemical companies and again with government agencies. The third party types and the various roles played by them, were identified by all stakeholder types but were most frequently identified by pesticide users, indicating that the contribution of third parties is particularly relevant to this stakeholder type.

Pesticide retailers are not only a recognised source of advice for pesticide users but are also responsible for ensuring that restricted pesticides are sold only to licensed users. In this sense, the pesticide retailers have some responsibility in the day-to-day enforcement of the certified user licence system. Although retailers themselves are subject to licensing controls and enforcement, the responsibility of the pesticide retailer, in ensuring that persons purchasing restricted pesticides are licensed, means that in fact the retailers have a role in the application of the user licensing system. The agro-chemical companies are also subject to regulation but may be requested to assist pesticide users with application or with other aspects of pesticide handling such as monitoring of application. Again, in this respect, the

agro-chemical companies are fulfilling a role in implementation since they have some responsibility in ensuring that pesticide users follow recommended or regulated practices. It can be seen that these third parties play an important role in the pesticides control framework. Although they are stakeholders themselves, and sometimes part of the regulated community, these parties sometimes form a bridge between the PCB and particular sections of the regulated community. Since these third parties may be providing advice or assistance, to pesticide users in particular, they must ensure that this is consistent with the pesticide control legislation and in this sense have some responsibility in the implementation and enforcement, as relevant, of the framework. In this respect, although these third parties have a potentially positive role in the pesticides control framework, this will only be so if that role is carried out properly, in accordance with the legislative and policy controls of the PCB.

The role that third parties play can be a positive aspect of the pesticide control framework. Since the PCB has limited resources, and it has been identified that stakeholders feel that there should be an increase in some of the activities of the PCB, the assistance provided by these third parties may ease the implementation burden of the PCB. By involving these third parties in some aspects of the controls, the PCB's co-operative approach can be extended, in particular this involvement can enable those third parties who are also members of the regulated community to feel that they are working in collaboration with the PCB, towards the attainment of pesticide control objectives, rather than that they are simply the subjects of regulation. It can further assist with compliance by providing an increased number of points of contact for pesticide users which means that they may be more likely to receive the assistance or advice they need in order to achieve appropriate practices.

This potentially positive role could, however, also be a weakness if the role of these third parties is not properly recognised and incorporated by the PCB and the third party. Some particular situations may result in a third party role becoming ineffective or inappropriate. If the role of the third party is not sufficiently clear

and identifiable to that third party, they may not be able to carry out that role effectively. For example, if a party is not sufficiently aware that it is seen as a source of advice by pesticide users, it may not maintain a position which enables it to provide the type of advice that is required in accordance with the regulations. This may hinder, rather than help, the user in terms of his or her own practices. If the necessary information, in terms of the regulations, is not made clear and accessible to the third party then, again, this will hinder the third party's' ability to give appropriate advice. Thus, whilst the burden is eased in some respects, the PCB must ensure that these third parties are in a position to be able to contribute competently to pesticides control through the roles which have been associated with them.

The PCB must also continue to perceive these third parties as being subject to the controls as well as assisting with some aspects of those controls. It is important that an appropriate level of enforcement and collaboration takes place between the PCB and these third parties to ensure that there is no abuse of the role. Two detrimental outcomes may result as a failure to do so. The first is that the overall level of compliance may be adversely affected. In situations where a party is asked to advise on a particular aspect of pesticide handling that is covered by the pesticide control regulations, but does not give appropriate advice, then the user is unlikely to be in a strong position to adopt appropriate practices. In the case of pesticide retailers a large degree of responsibility for the impact of the certified user licensing system relies on those retailers requiring the user licence. A failure to do so can result in unlicensed users using restricted chemicals. This in itself is in breach of the legislation and in turn could lead to further adverse effects such as an increased possibility of pesticide resistance and environmental pollution.

Secondly, a situation in which a hierarchy of regulatory subjects is perceived will be detrimental to the positive relationship that the PCB has built between it and other stakeholders, a relationship which is important in terms of the overall impact and success of the Pesticides Control Act. If a particular section of the regulated community feels that another section of that community is not subject to the same

type and level of regulation and enforcement then they may develop hostility toward the regulatory agency and be less likely to implement recommended practices. A small minority of interviewees, for example, consider that the PCB does not always take enforcement action against the agro-chemical companies in instances of non-compliance with, or direct breach of, regulations (see Figures 5.9 and 5.10). One stakeholder comments, for example: "*but um, to me, many times I've seen that the main industry in pesticide...are board members...before I always thought that that was a, a benefit...and that was something good for the board to have them as members, but to me it, to me it ( ) looks as a way for them to get away, cos they are board members and um, like, things are more smooth*"[441]. The agro-chemical companies and pesticide retailers were directly identified as the subjects of enforcement much less frequently than pesticide users (though agro-chemical companies were sometimes recognised as subjects of enforcement under the category 'other subject').

[441] PCB interview 18

5.2.5 The role and composition of the Board of Directors

The Board members represent the various sectors involved or interested in pesticides control and are responsible for the implementation of the PCA at the policy level as well as having some direct regulatory functions such as decision making in regard to the registration of pesticides. The decisions emanating from the Board determine, to a large extent, the action that is taken by the Secretariat in relation to the implementation of the PCA. It is important, therefore, that the Board is aware of current pesticide control issues so that they are able to respond effectively to them as necessary.

Although negative perceptions of the Board are infrequent (see Figure 5.8–5.11), it can be seen that there are discrepancies between some aspects of pesticides control as identified by non-board members compared with those identified by Board members. The role of third parties was frequently identified by non-board members and indicates that for these stakeholders, particularly pesticide users, third parties play a clear role in pesticides control. However, at the Board level the involvement of third parties was identified on only one occasion (see Figures 5.32 and 5.35). As argued above, a failure on the part of the Board to recognise the importance of these roles could be detrimental to the overall level of control. Without acknowledging and responding to the role being played by these third parties the Board is leaving the practical operation of some aspects of pesticides control unmonitored.

Board members identified a predominantly mixed approach to enforcement, with little recognition of a completely informal approach (see Figure 5.39). This contrasts with the primarily informal approach identified by non-board members. Board members did not, generally, identify pesticide users as the subject of enforcement though pesticide users were the subjects most commonly identified by non-board members (see Figure 5.45). This can be explained, in part, by the fact that non-board members include pesticide users who generally discussed enforcement in terms of their own experience, rather than the broader perceptions that may be held by Board members. However, pesticide users are identified as the

most common enforcement subject by the Secretariat. Again, a difference between the enforcement activity perceived by Board members and that actually identified by the regulated community and the Secretariat could lead to weaknesses in the pesticide control framework. In the case of enforcement, several interviewees identified a need for an increase in enforcement and particularly for more formal enforcement action. However, if the Board members perceive that there is already a formal approach to enforcement the necessary policy adjustments will not be made. A similar problem may be occurring with respect to the need to amend the legislation. Insufficient recognition by Board members of the identified regulatory gaps could be the reason why CoPs are yet to be introduced, despite recognition from some other stakeholders that these issues need to be addressed.

In this respect communication is important. There must be clear and effective communication between Board members and other stakeholders. On some occasions, Secretariat members indicated that there should be a more formal approach to enforcement but this was not generally reflected at the Board level. Three Secretariat members noted that the Secretariat would like to, or would have liked to, take a particular course of action but that the Board did not consider this appropriate. The issue is highlighted by one technician, "*We should do more farm visits which we do not do which the board is against doing farm visits...Which, which I have always, always on the, on the, on the um, thinking that we have to do farm visit to monitor the use of pesticide. But at the board level they are suggesting that it is the extension officer's job*"[442]. A similar situation is reflected in the case of the recognition of the role of third parties. It should be the case that there is communication and feedback between Board members and other stakeholders. While the Board members ultimately have authority in terms of introducing legislation and policies, the communication between Board members and other stakeholders could enable these measures to be as effective as possible. In particular, the pesticide control technicians can form an effective means of communicating practical problems and implementation issues to the Board members who will then be able to address these problems more effectively.

---

[442] PCB interview 40

Furthermore, this type of communication could assist with the efficient use of resources by allowing the Board to be aware of practical issues as well as those policy issues that have already been identified.

The composition of the Board has remained an ongoing issue. Generally, the structure of the Board, including representation at Board level and the use of various sub-committees, was viewed positively (see Figures 5.8 and 5.11). Perceptions of the agro-chemical industry were mixed (see Figures 5.8–5.11 and 5.36). Several stakeholders, primarily pesticide users, identified the companies positively, particularly in terms of their assistance with pesticide handling. However, some negative perceptions of the industry were identified concerning their involvement with pesticides control, particularly at the Board level. Though these negative perceptions were not identified by the majority of stakeholders, they do indicate some issues for the involvement of the agro chemical industry. One issue is that the PCB's co-operative approach to enforcement appears to have been extended to the whole of the regulated community, including the agro-chemical industry. A small minority of interviewees indicated that they consider the position of the industry on the Board to be negative, that the Board is controlled by the pesticides industry or that the PCB does not sufficiently enforce against other Board members (see earlier). One stakeholder, for example, considers that the industry does have a significant influence on the decisions made by the Board, "*Um, the board composition too um, I think there was always an issue about that, about having the, the big uh, importers being part of the board. I um, they, as long as we still have majority for decision making and they're not part of the registration committee I think, I think that's still ok and I think that's how they manage that um, but their influence on the, on the, on the actions of pesticide control board is pretty strong I think*"[443]. The co-operative approach to enforcement is beneficial to the PCB in that it encourages positive working relationships. This means that the agro-chemical industry should be more likely to consult the PCB when necessary and be in a better position to achieve compliance. A negative aspect of the approach is that it is not transparent and therefore other

[443] PCB interview 31

pesticide users may perceive the agro-chemical companies as receiving favourable treatment, whether or not this is the case, since they will not be aware of any action taken.[444]

Though negative perceptions of the agro-chemical industry are held by only a small minority of stakeholders, some of those perceptions emanate from the Secretariat and the political implications of the position of the industry cannot be overlooked. It has been seen, above, that these views suggest that the industry is sometimes perceived as influencing the decisions made at the Board level. The industry respondents (like many stakeholders) noted a need for increased training and education. A perceived need for increased enforcement focused on a need to ensure that labelling requirements were complied with and a need to undertake monitoring to prevent contraband, rather than a need to enforce the user licence. An increase in enforcement would be likely to have a detrimental economic impact on the agro-chemical companies, through tighter control of the use of restricted pesticides by unlicensed users and the sale of those pesticides by pesticide retailers. As has been noted, in one interview a pesticide retailer noted that he was under pressure to meet sales targets from the suppliers — the agro-chemical company — and this therefore put him in a difficult position in relation to requesting the certified user licence: "*I would have problems with my customers and I also with my um, with the company itself, cos if I don't, if I don't make enough sales then they will want to ( )...And then this licence business affects it (a lot)*"[445]. See Figure 5.22. It has been seen also that the agro-chemical industries have a recognised role in assisting with the application and handling of pesticides and in providing advice on those pesticides (Table 5.2). In this respect they are in a position to encourage the sale and use of their particular products as opposed to those of a rival company. The overall situation indicates that there are strong reasons for the agro-chemical companies to encourage the furtherance of the

---

[444] Black comments that the composition of the Board of Directors has improved since its initial inception, particularly due to the exclusion of representatives of the pesticides industry from the Registration Committee. Black also notes, however, that there is no provision requiring Board members to leave a meeting of the Board of Directors in instances in which there might be a conflict of interest (for example, in cases where registrations are discussed). See Black, op. cit., pp.33–35 and 49.

informal and educational approach to pesticides control rather than one based on the use of strict enforcement and the use of penalties. For these reasons also the issues outlined above, though by no means indicating any significant problems, highlight the importance for other stakeholders to be able to clearly identify instances of non-compliance on the part of the agro-chemical company and the action that is taken in response.

A further issue in relation to the functioning of the Board is the dissemination of information from the Board members to relevant stakeholders. As recognised by a member of the Secretariat it has been considered that one of the purposes of having the varied Board membership, apart from receiving input from different types of stakeholder, was to be able to then disseminate decisions made at the Board level back out to stakeholders and the regulated community. However, it was considered, in the same interview, that in fact this is not always taking place:

> *"I think we should have more interaction with different stakeholders...But we have fourteen persons on the Board who should essentially be the most important stakeholders at any given time cos they are appointed every two years. Um, I believe that um, what may be happening in a lot of cases is that these persons are appointed and although they remain appointed to the board for term after term after term...I think that we've always assumed that their responsibility as representatives of their sectors was to go back and pass the information to the different persons in their organization or to the different members of their industries...and um, we, I think that it just hasn't been happening like that"*[446].

The Board members have an opportunity to assist in the implementation of the pesticide control framework in some respects by publicising decisions made by the PCB to the relevant stakeholders. For example, representatives of producers associations are in a position to disseminate information to the members of that association. A problem in this respect, identified on some occasions as a weakness of the PCB, is the voluntary nature of the Board members (see Figure 5.10). This effectively means that members have limited time to spend on pesticide control functions.

---

[445] PCB interview 16
[446] PCB interview 41

All of the issues identified in relation to the role of the Board are, at least in some part, reliant on effective communication. Whereas at the Secretariat level implementation has been assisted by effective communication, through various types of interaction with stakeholders, at the Board level this interaction appears to be more limited. Thus, certain stakeholders, including Board members, may not be sufficiently aware of the nature and scope of the role that they are perceived to have in pesticide control. This is perhaps reflected in the apparently weakened working relationships at the Board level. It appears that there are some negative perceptions between Board members and the Secretariat. Secretariat staff do not always perceive the Board as taking the appropriate, and necessary, approach to implementation and enforcement and a few stakeholders, including some at Secretariat level, question the integrity of the representation of agro-chemical industries on the Board. Board members themselves, it appears, do not always have a view of the problems and issues at the ground level that is consistent with the views of other stakeholders. It may be that a lack of appropriate communication, particularly clarification of the scope and extent of the roles of various stakeholders, is weakening the working relationships between Board members and other stakeholders.

5.3 SUMMARY OF STRENGTHS AND WEAKNESSES OF THE PESTICIDES CONTROL FRAMEWORK

Strengths

- *Focus of PCB on education and co-operation with stakeholders and use of training and educational activities*
- *Informal, positive working relationships between PCB and regulated community*
- *Stakeholders' perceptions of PCB assisting stakeholders and as a service-based agency*
- *Certified user licence as an incentive for compliance*
- *Contribution of third parties*

Weaknesses

- *Extension of co-operative approach to enforcement*
- *Perceived need to increase enforcement levels or improve enforcement activities*
- *Dual role of technicians in assisting stakeholders and enforcing regulations and the lack of distinction between these two types of activity*
- *Disparities between perceptions of members of the Board of Directors compared with other stakeholders*
- *Extent of communication between Board members and other stakeholders*

Mixed messages

- *Adequacy of legislative framework*
- *Involvement of agro-chemical companies on the Board of Directors*

5.4: THE FIRST PHASE OF FIELDWORK AS A PILOT STUDY

The study of the pesticides control framework was originally intended to be a pilot study, to identify whether the proposed methodology would be useful. It can be seen that the methodology and data collection methods were found to be useful since they enabled a number of insights to be made into the strengths and weaknesses of the framework. In this respect, the researcher was particularly fortunate that no access difficulties arose and a wide range of stakeholders were therefore successfully involved. Because of this, the PCB study not only indicated that the methodology could be usefully applied as envisaged but also provided substantive findings which would enable a comparison with the findings of the second phase of investigation.

As indicated, apart from minor revisions, no serious difficulties arose with the interview questions though the use of detailed interview notes was found to be important because difficulties could sometimes arise with the recordings (see Chapter 3). The accompanying survey was felt to be of more limited value, particularly in light of the broad range of issues identified through the interviews compared with the small range of issues contained in the survey. As described in Chapter 3 there were also some difficulties related to participants' interpretation of the survey questions. These issues combined with the fact that the interviews produced vast quantities of data which was certainly valuable but which also took a long time to transcribe and analyse, led the researcher to consider that in the second phase of fieldwork this aspect of data collection might have to be omitted. This was, in fact, the case (see Chapter 3).

Generally, the data collection methods worked well. Other, broader, methodological aspects were also valuable. The involvement of a broad range of stakeholders and the identification of issues at the 'ground level' was immediately seen to be beneficial and the range of perspectives represented in the findings was extremely valuable. The researcher experienced greater difficulty with one of the general procedures of grounded theory however. This was the analysis of data in

the field. As seen in earlier chapters, according to Glaser and Strauss, theoretical sampling provides that ideally data collection and analyses should be joint ventures. Data should be collected and then analysed before further data is collected, to ensure that data collection remains theory driven.[447] Glaser and Strauss consider that on this basis data collection could take many months with long breaks in between for analysis.[448] This approach is very difficult to reconcile with the need for research to be undertaken in the context of limited resources and even more limited time frames.

In the present case, the researcher did try to ensure that sampling was theory driven. As discussed in Chapter 3, some initial data analysis steps were also taken in the field. More formal analysis was, however, more difficult to achieve in the field because of time restraints. After the first five interviews the researcher made some early analysis notes identifying the main issues raised. This was the extent of the formal analysis undertaken in the field. It is considered by the present researcher that it was simply not practical to undertake completely simultaneous data collection and analysis. The formal data analysis stages took many months, compared with the two week time frame for data collection. However, to consider that this should act as a barrier, preventing the application of grounded theory, would mean that the extent of research activities under this methodology would be severely limited. In the present case, it is not considered that these difficulties with theoretical sampling served as a real impediment to the study. The researcher was still able to gain a useful sample and to conduct analysis on the resulting data which provided the type of insights hoped for. It is not considered that this approach detracted from or prevented the development of theory.

---

[447] See Glaser and Strauss, 1967, op cit., Chapter 3.
[448] Glaser and Strauss, 1967, ibid., p.73.

Chapter 6: The Belize Agricultural Health Authority — Findings and Analysis

In chapter 5 the findings of the PCB study were presented and the broader implications discussed. Similarly, the present chapter on the agricultural health framework consists of two parts. In the first part, the findings, in terms of coded responses derived from both grounded theory and content analysis, and a preliminary analysis of these, are presented. This part of the chapter is divided into three subsections: (i) the perceived role of BAHA and awareness of agricultural health regulation, (ii) perceptions of BAHA and the agricultural health framework and (iii) other influences on the agricultural health framework. The codebook providing coding instructions for the content analysis can be seen in Appendix 6. In the second part of the chapter the findings are further analysed and the implications of these in terms of the successes and weaknesses of BAHA are discussed. This discussion focuses on the findings and issues in a broader context and is divided into seven subsections: (i) perceptions and impacts of the cost recovery system, (ii) the interaction between BAHA and other stakeholders, (iii) the legislative framework, (iv) the autonomy of BAHA, (v) the role of third parties in the regulation of agricultural health, (vi) the impact and perceptions of international sources of law and (vii) the influence of 'external' sources of control on the private sector. Finally, a brief summary of the key findings, in terms of identified strengths and weaknesses of the agricultural health framework is presented.

6.1 FINDINGS AND ANALYSIS OF CODED RESPONSES

6.1.1 The perceived role of BAHA and awareness of agricultural health regulation

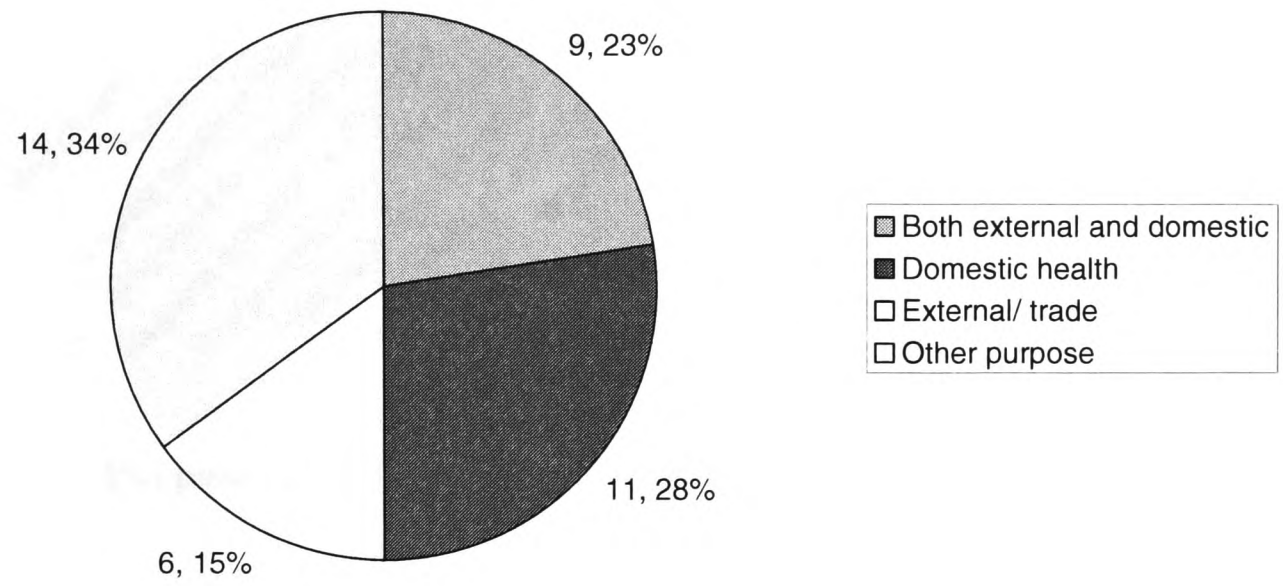


Figure 6.1: Identified purpose of regulating agricultural health (overall totals and percentage of total)

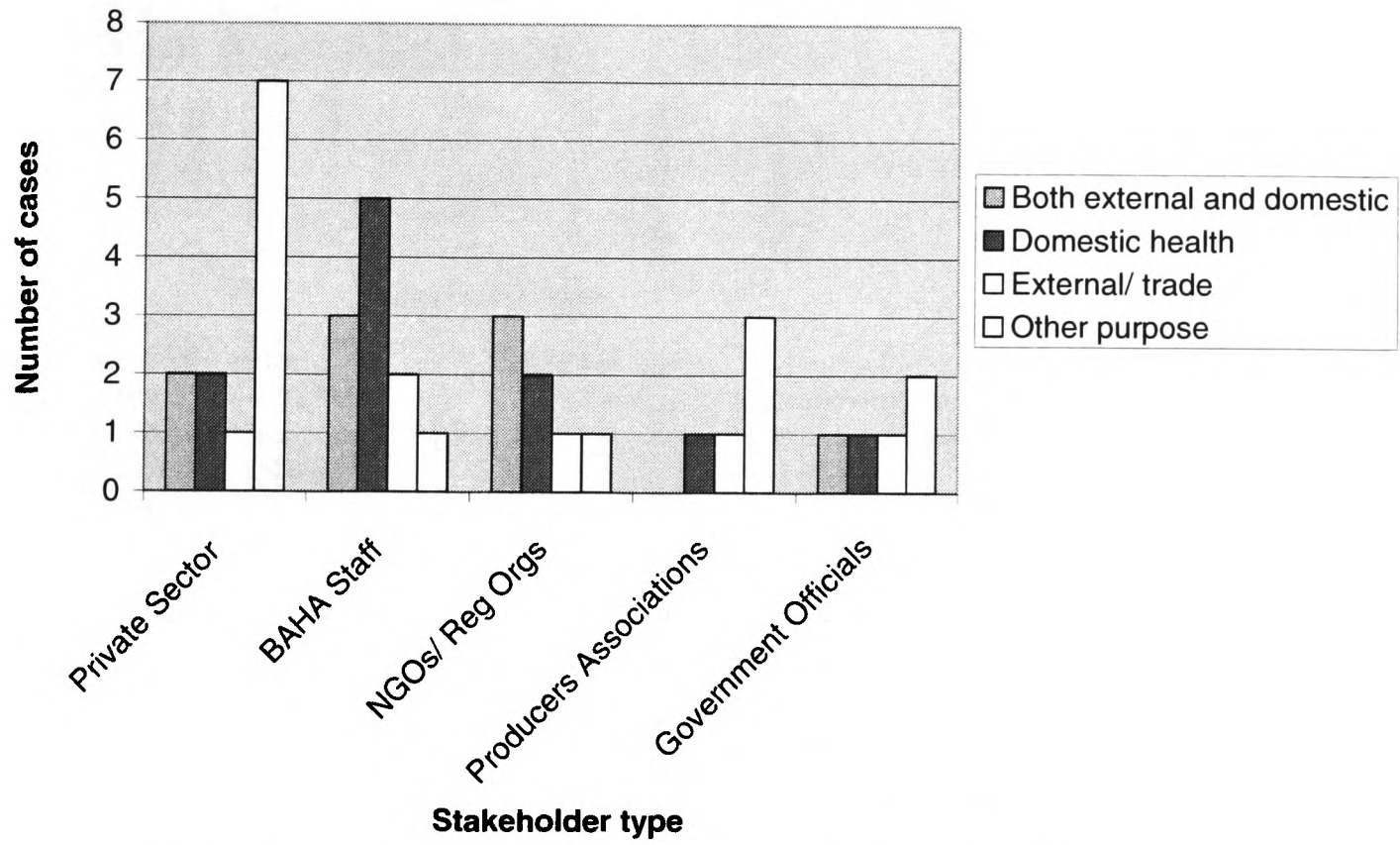


Figure 6.2: Identified purpose of regulating agricultural health (by stakeholder type)

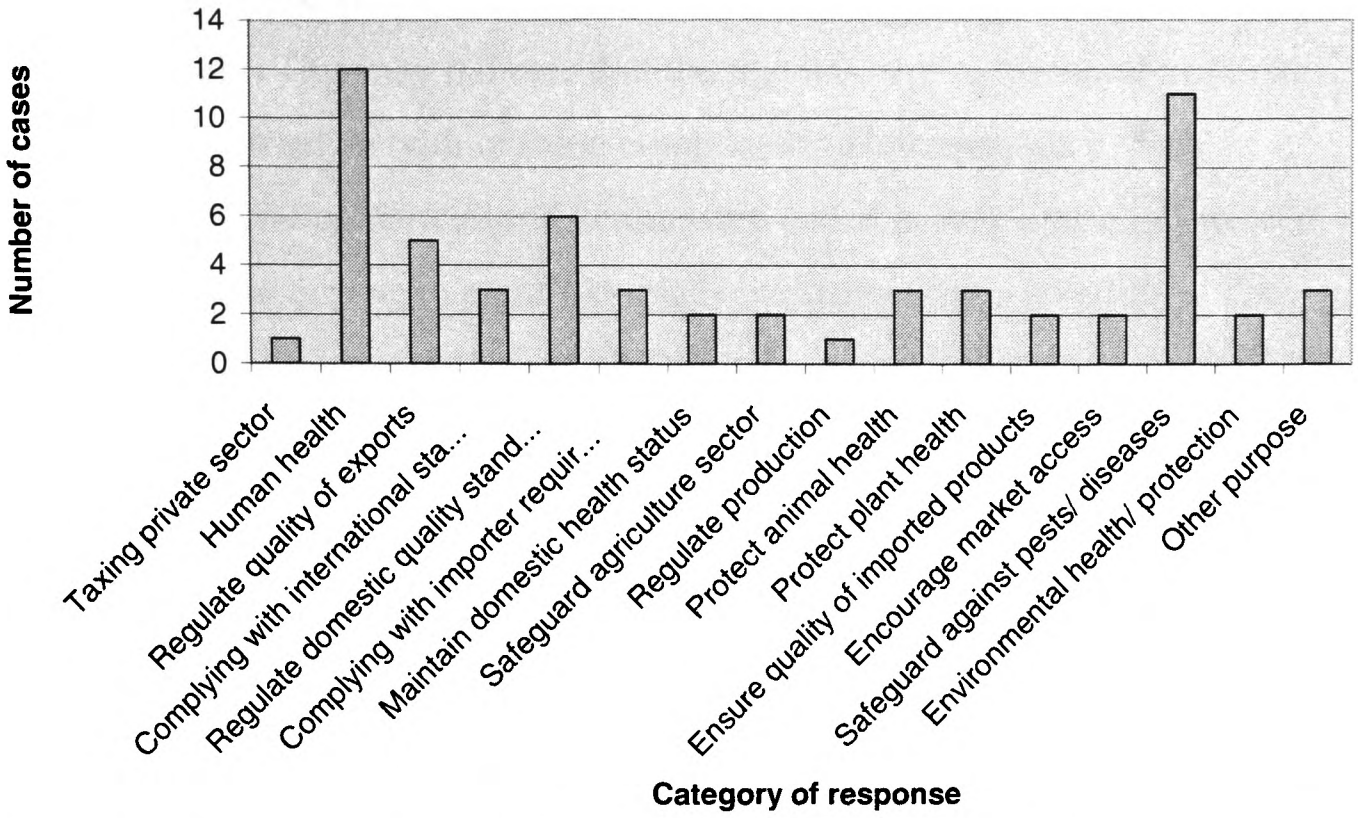


Figure 6.3: Purposes of regulating agricultural health (specific aspects) (totals)

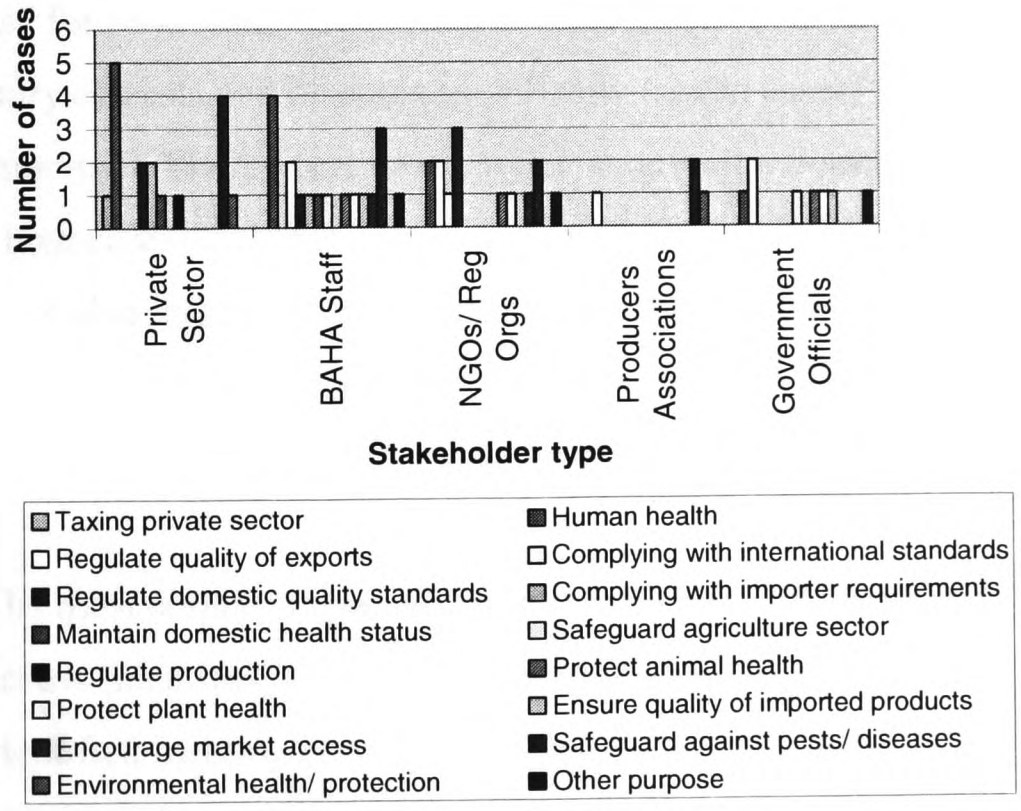


Figure 6.4: Purposes of regulating agricultural health (specific aspects) (by stakeholder type)

It can be seen in Figures 6.1–6.4 that there is no general consensus concerning the purpose of regulating agricultural health. The emphasis on external and trade

objectives and domestic objectives (and general responses related to human health) was split. This may indicate that the regulation of agricultural health has successfully focused on both of these components. However, since 'both' purposes of regulating agricultural health were coded in only nine cases in total, it would perhaps be unwise to place too much emphasis on this possibility. The variation in coded responses by stakeholder type suggests that perceptions on the focus of regulation, in external or domestic terms, are not consistent. The purpose of regulating agricultural health, in these terms, may be unclear to stakeholders, or stakeholders may have conflicting ideas about what the purpose is (see Figure 6.2). As seen in Figure 6.1, 'domestic' and 'other' purposes (primarily general human health objectives) were identified somewhat more frequently than 'external/trade objectives' as the purpose of regulating agricultural health, with 'other purpose' being the most frequently coded response.

In terms of domestic health objectives, stakeholders most frequently identified the need to protect the local population, including the need for consumer protection and for food safety (identified in eight of the coded responses). Preventing the entry of pests and diseases specifically (seven cases) was perceived to be important. The protection of Belize's agricultural sector and resources generally, (three cases) and specifically in terms of animal and plant health (four cases each) were also important. The need for quality control, protection of "users" [pesticide users] and protection of the economy were each mentioned in one case and general or non-specific comments were given in five cases.

The most common type of response coded as 'trade/external' related to market access (identified in 10 of the coded responses). A further three responses identified meeting/complying with international standards/obligations as an objective. Human health, in terms of the health of importing consumers, was identified in two cases and the need for quality control for exported goods was identified in one case.

'Other' purposes were coded in 14 cases (34% of responses). The most frequent objective (coded in six cases) was human health. In these instances the references did not clearly indicate whether domestic or external consumers, or both, were being referred to. Five of the coded responses included comments which were too vague or ambiguous for any specific objective to be identified. Other objectives included preventing the entry of pests and diseases, protecting plant health and animal health, protecting the agricultural sector generally, ensuring quality standards, environmental health, environmental protection and taxing the private sector. All of these were coded in either one or two cases and phrased in such a way that the overall objective (domestic or external) could not be clearly identified.

Figure 6.3 presents grounded theory codings related to the purpose of regulating agricultural health and highlights the broad range of responses that were identified. 'Human health' is the most common specific aspect of regulation, followed by the need to 'safeguard against pests and diseases' (as in the findings discussed above). One (private sector) stakeholder identified the purpose of regulating agricultural health as 'taxing the private sector'. At this more specific level also, no particular issue was identified by a majority of stakeholders (Figure 6.3). This was not only the case in overall terms, but was also reflected in the findings by stakeholder type, as seen in Figure 6.4. Again, this perhaps indicates a lack of awareness about what the purpose of regulating agricultural health is.

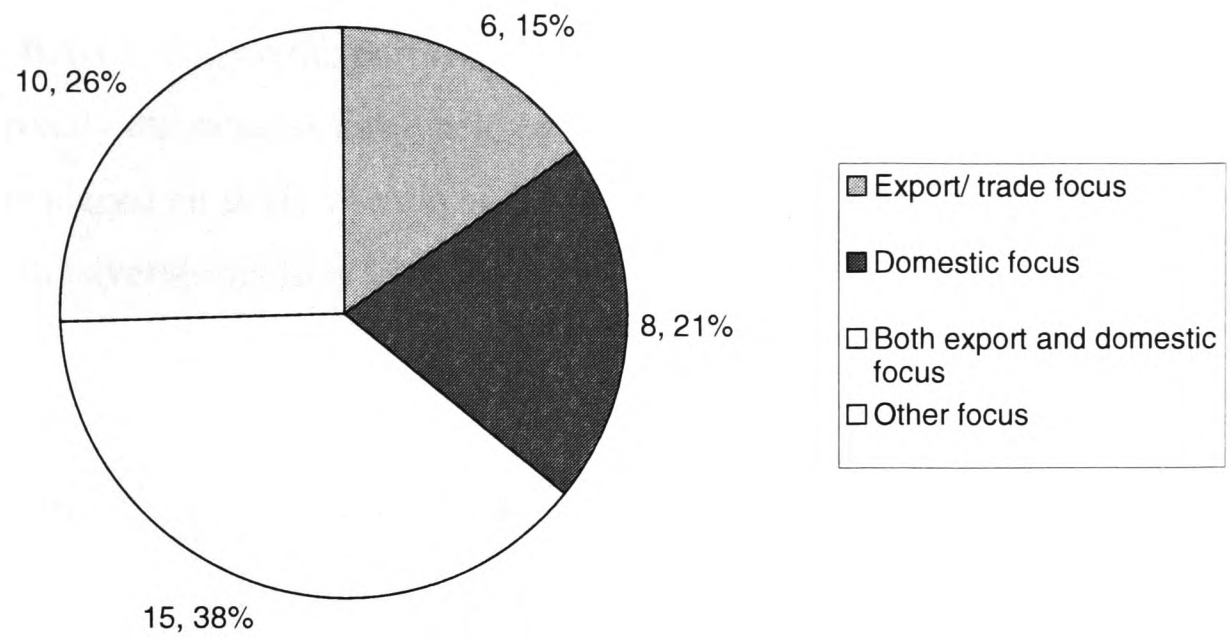


Figure 6.5: The role of BAHA (overall totals and percentage of total)

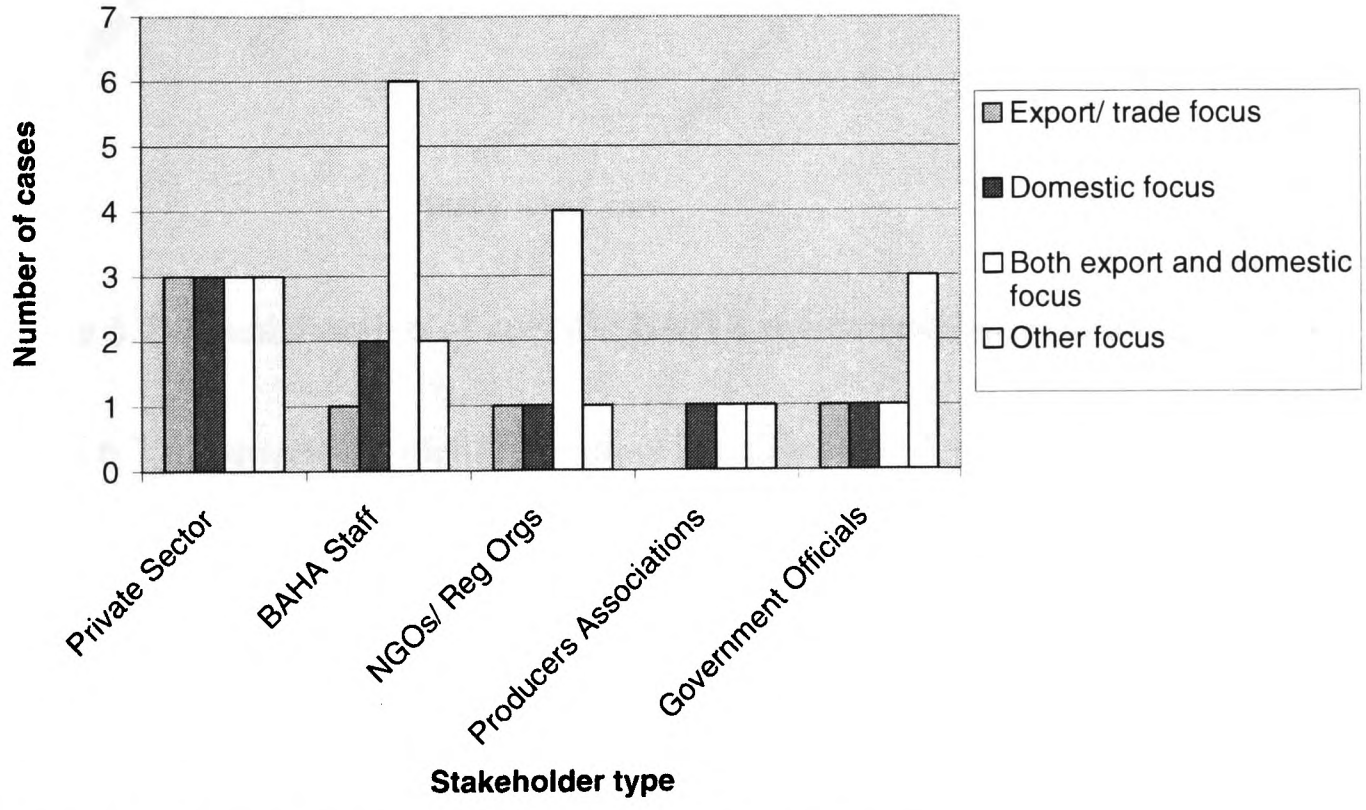


Figure 6.6: The role of BAHA (by stakeholder type)

The findings related to the perceived role of BAHA are similar to those discussed in Figures 6.1–6.4, above. In the present case the perception of BAHA having a role focused on 'both domestic and external' issues was higher than other categories and this suggests that there is perhaps greater consensus of what

BAHA's role is (Figure 6.5). The findings in Figure 6.6 suggest though that this is not consistent for all stakeholder types. There is, however, greater consensus on the role of BAHA than on the purpose of regulation; perceptions held by BAHA staff are broadly the same as those held by NGOs/regional bodies and a similar emphasis is placed on BAHA's role in 'both' aspects of agricultural health as appears in the overall findings (see Figure 6.5).

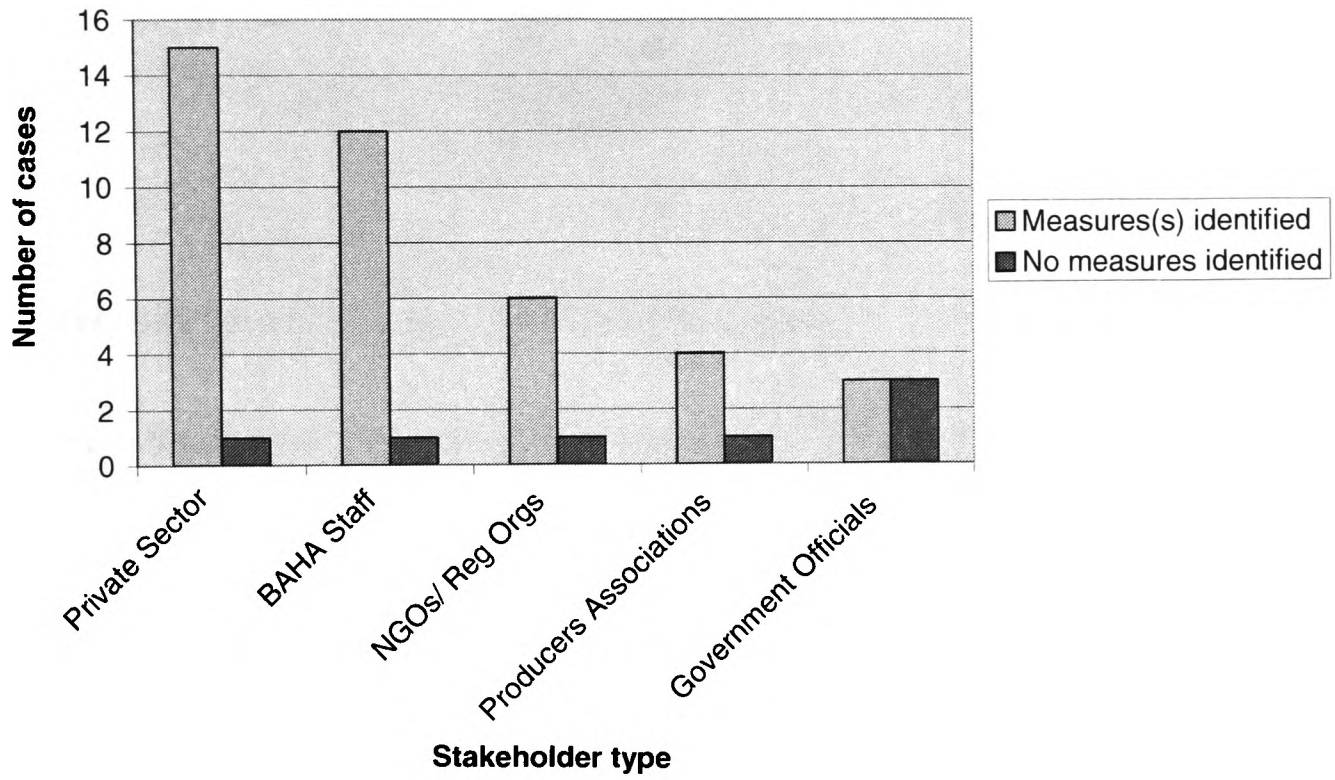


Figure 6.7: Identification of specific BAHA measures (by stakeholder type)

Figure 6.7 illustrates the identification of specific BAHA measures (as opposed to general awareness of the role or activities of BAHA or awareness that there are measures generally speaking). Forty of the 47 interviewees identified at least one specific measure. In fact a lack of identification amongst stakeholders other than the private sector is not of great significance since these stakeholders were not specifically asked to identify BAHA measures. Private sector stakeholders were, however, asked to identify such measures, as applicable to them, and it can be seen that only one interviewee in this category was unable to identify any specific measures.

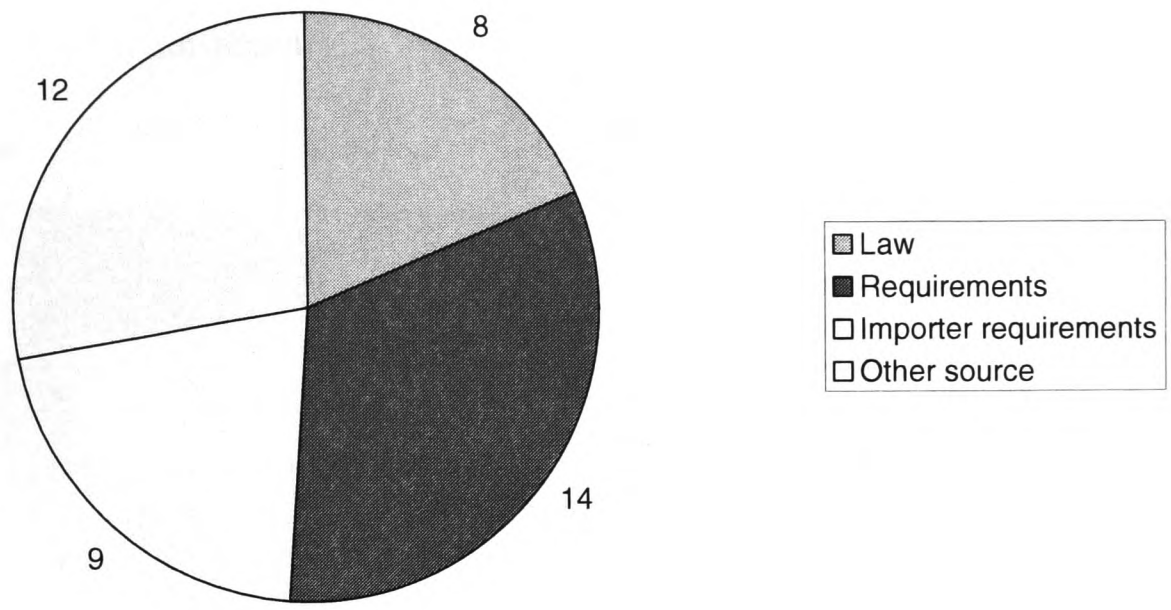


Figure 6.8: Identified sources of control (totals)

Figure 6.8 demonstrates the various sources of legal control which private sector interviewees indicated as having some relevance to, or impact on, them. It can be seen that of the 16 private sector interviewees, a large majority (88%), identified some type of informal [BAHA] 'requirement' as a source of control. Interviewees also identified the 'law' formally as a source of control in half the cases.

An important source of control was 'importer requirements' identified in 56% of cases. References in this category included both general indications that the interviewee operated according to the importer's requirements, and also reference to specific controls, for example, in some cases the need to implement a HACCP system was considered to be based on the requirements of importing countries. The controls were most commonly associated with the EU and the USA. Several interviewees identified having made changes or complying with particular measures because they are requirements of importing countries rather than because they are required by BAHA. (External (importing) regulatory authorities were also identified as third parties by six private sector interviewees, see Figure 6.39.)

'Other sources' include domestic controls and measures, primarily related to pesticides control and environmental regulations, as well as 'external' controls

including international and other standards such as the adoption of Codex or, in particular, HACCP standards or the use of EU standards, (where not identified as a BAHA or importer requirement).

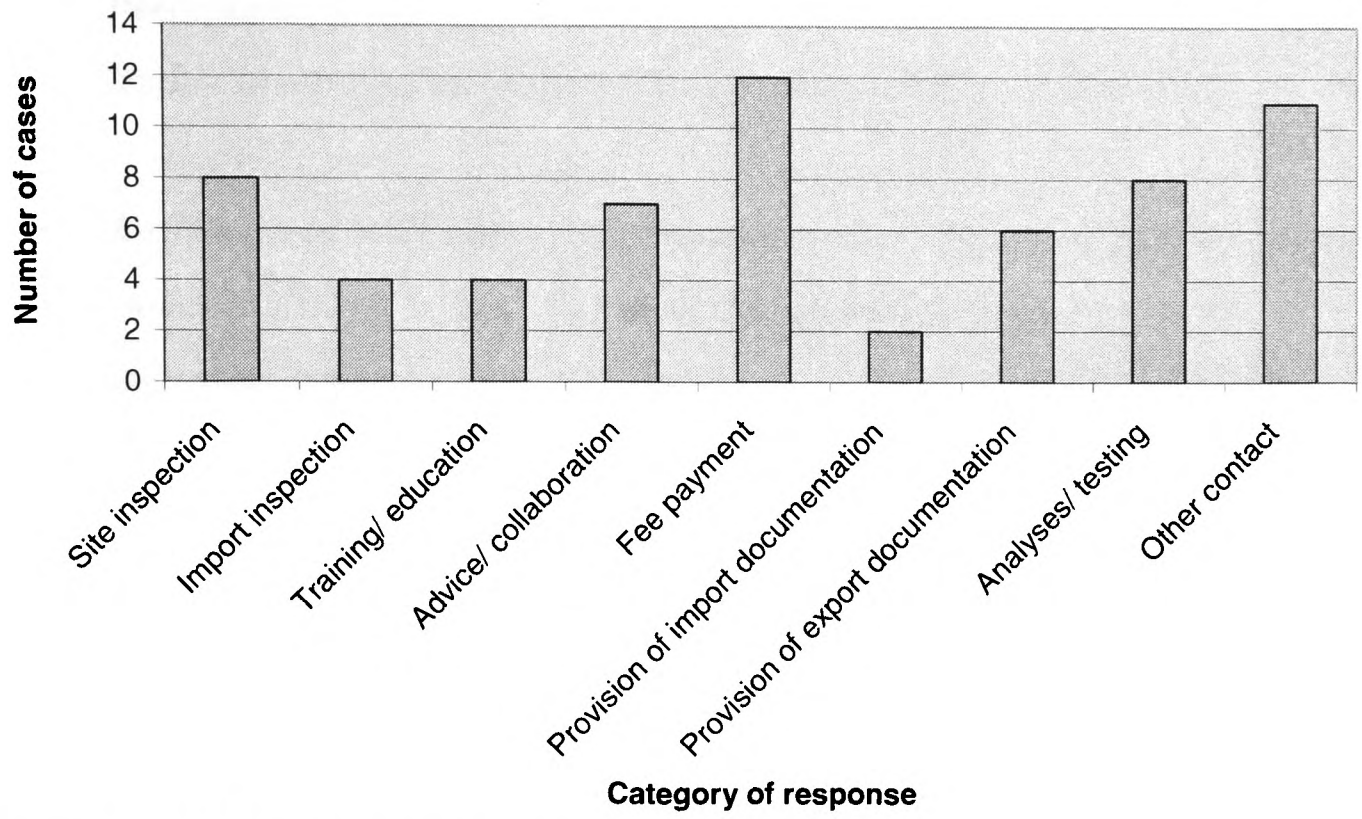


Figure 6.9: Private sector contact with BAHA (totals)

The types of contact that private sector stakeholders identified as having with BAHA were primarily enforcement-based or administrative in nature, consisting mainly of fee payment, inspections and analyses and the provision of documentation and certification. Several of the private sector interviewees were involved with export and such contact was often associated with export requirements. As well as the provision of export documentation, other contact such the undertaking of analyses and testing was often related to export requirements. Four interviewees identified having had contact with BAHA for training or education purposes. General advice or collaboration was somewhat more frequent, identified in seven of the sixteen cases. These findings suggest that there may be some discrepancy between the types of activity that are positively supported, and which stakeholders consider should be increased, or are lacking, and the actual contact that the private sector is having with BAHA (see Figures 6.21 and 6.29).

Summary of Part 1 findings:

- *No single issue is identified by a majority of stakeholders as the purpose of regulating agricultural health.*

- *Perceptions of the role of BAHA and the purpose of regulating agricultural health, in terms of the domestic health and trade/external focus, are mixed.*

- *Awareness of BAHA laws and requirements was high among private sector stakeholders but 'other' sources of control and the requirements of importing countries were also important. The majority of interviewed stakeholders referred to at least one specific agricultural health measure.*

- *The majority of contact situations which the private sector identified as having with BAHA were enforcement- or administratively-based and were often related to export requirements.*

6.1.2 Perceptions of BAHA and the agricultural health framework

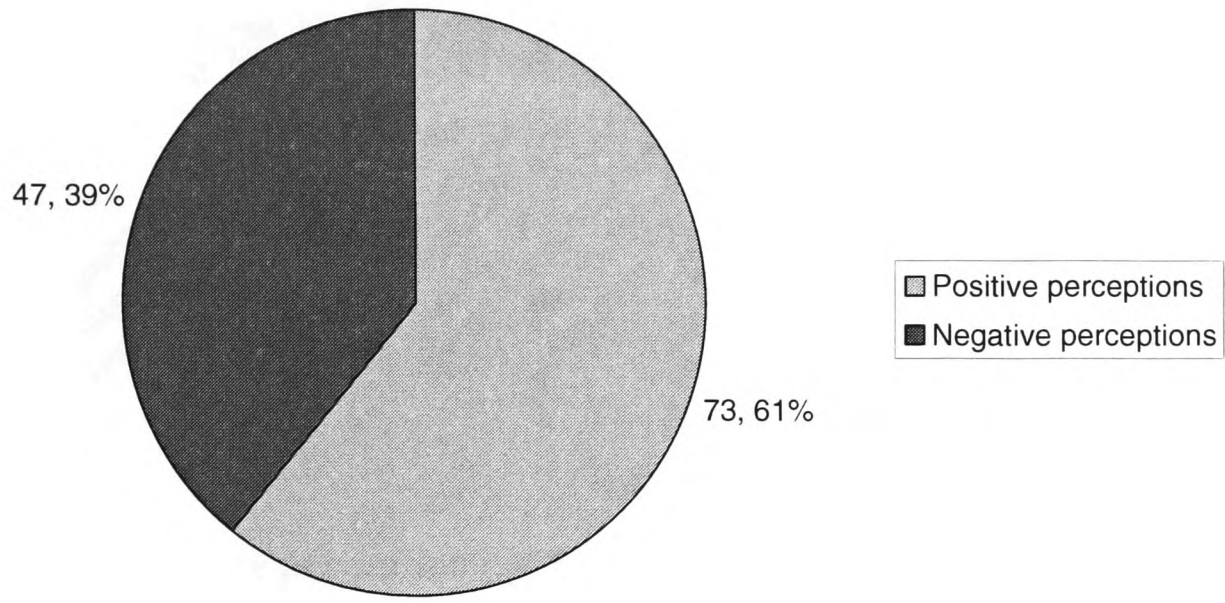


Figure 6.10: Positive and negative perceptions of BAHA (overall totals and percentage of total)

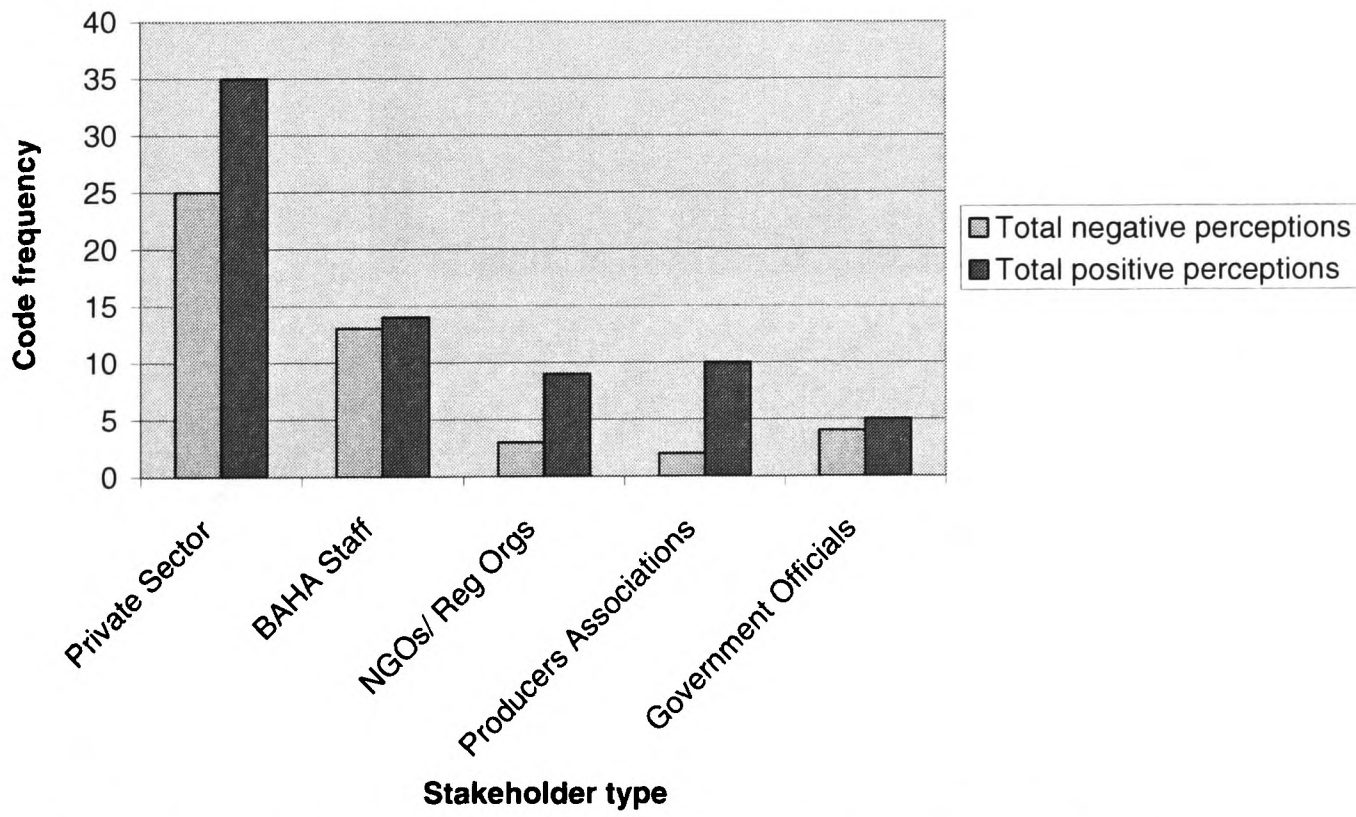


Figure 6.11: Positive and negative perceptions of BAHA (totals by stakeholder type)

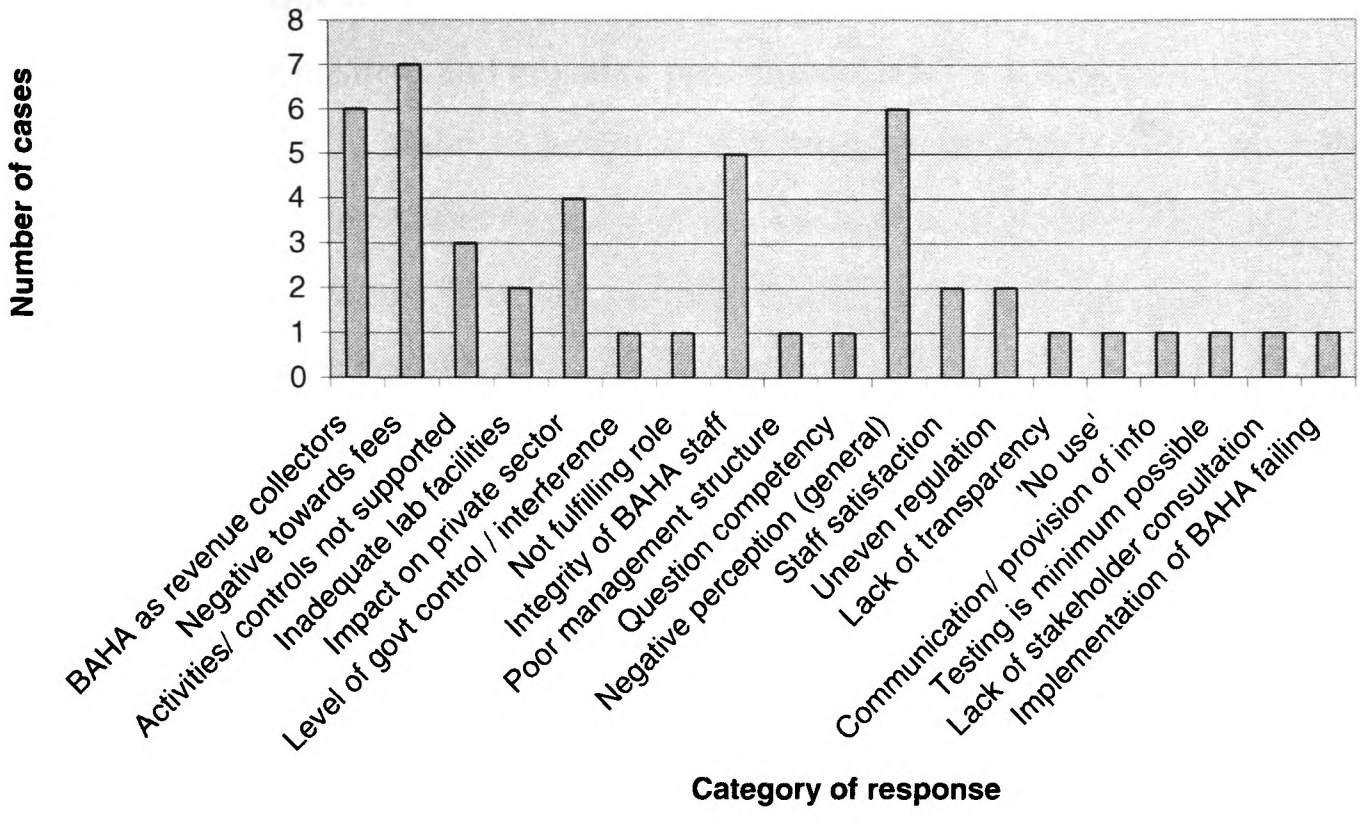


Figure 6.12: Negative perceptions of BAHA (totals)

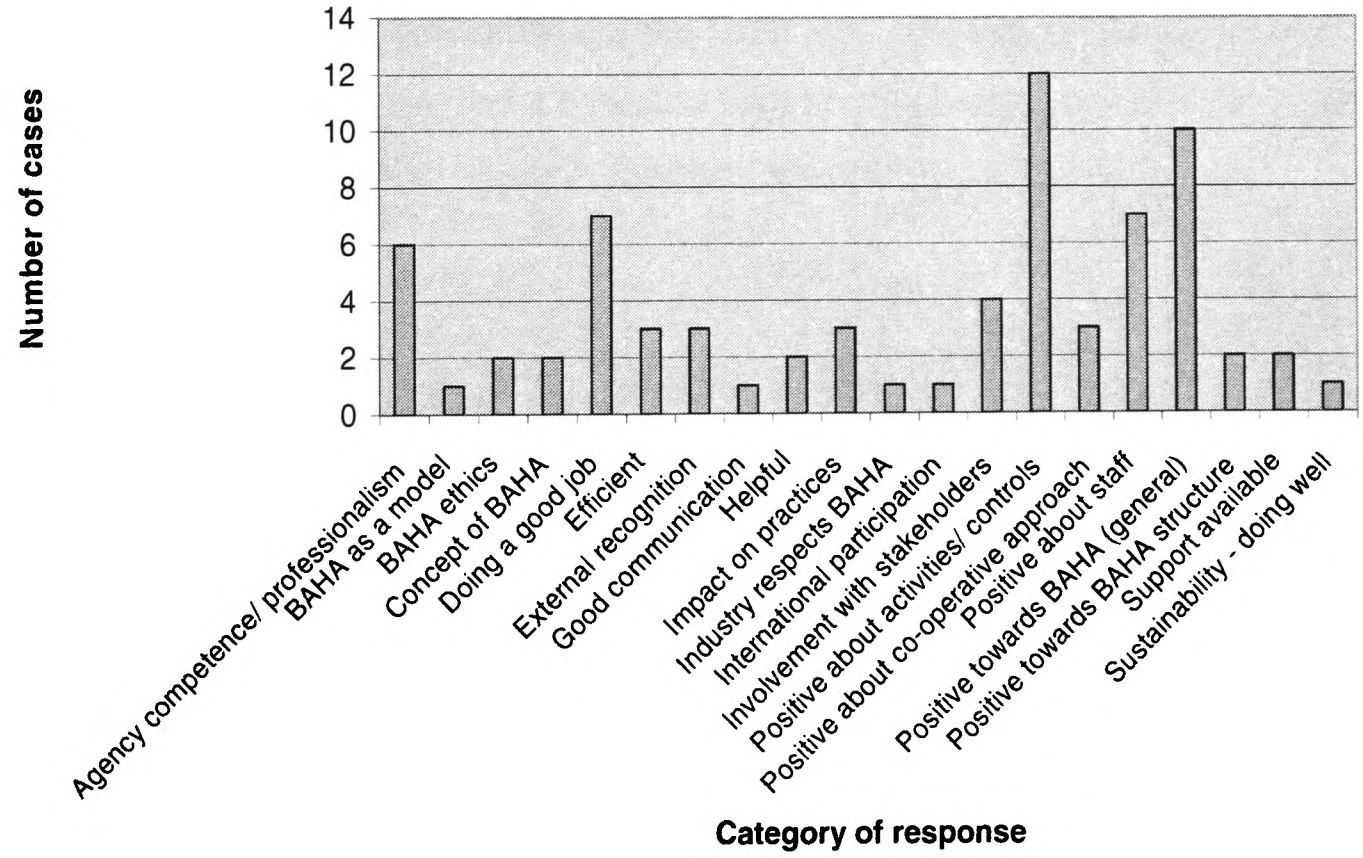


Figure 6.13: Positive perceptions of BAHA (totals)

Positive and negative perceptions were mixed, though positive perceptions were identified somewhat more frequently than negative perceptions (Figure 6.10). Figures 6.10 and 6.11 indicate that a total of 73 positive perceptions and 47

negative perceptions were coded (through grounded theory coding so that more than one different positive and negative perception could be coded per case). It can be seen in Figures 6.12 and 6.13 however, that the same or similar issues are often identified in both positive and negative terms. Positive perceptions of BAHA staff were coded in seven cases. The lack of integrity of BAHA staff was, however, identified as a negative perception in five cases. Other issues are also perceived in both positive and negative terms. In one case, for example, the level of communication is perceived positively, while in another it is perceived negatively. In two cases BAHA were perceived to be 'helpful', while in one case they were perceived to be of 'no-use'. In 12 cases stakeholders are seen to be positive towards BAHA's activities and controls but identified negative perceptions include a lack of support for some activities (three cases). Other aspects of the findings also indicate mixed perceptions of certain issues; see, for example, Figures 6.17 and 6.42.

A number of stakeholders hold positive perceptions of BAHA which are not diminished by negative perceptions of the same issue. BAHA are noted in three cases, for example, to have had a beneficial impact on private sector practices, and a perception that BAHA is 'doing a good job' was identified in seven cases (Figure 6.13).

It can be seen that in four cases 'involvement with stakeholders' was identified as a positive perception of BAHA (Figure 6.13). These comments focused primarily on the use of 'user groups' and the involvement of the private sector through discussion and general participation (see also Figure 6.14). A 'lack of consultation' was, however, identified as a negative perception in one case (see also Figures 6.20 and 6.29).

Some negative perceptions relate to fees and to the cost-recovery system that is in place. A negative perception of fees was the most common negative perception. Of the seven cases in which this perception was identified, five were private sector stakeholders. These comments indicated that the fees are too high and

consequently limit the extent to which the private sector can use services, or that the fees impact negatively on industries generally (for example, in terms of profitability, productivity or development). Other perceptions of fees, excluding those specifically coded as 'negative perceptions', above, can be seen in Figure 6.26. In six cases negative perceptions of BAHA as 'revenue collectors' were coded. (This view was either held by the interviewee or the interviewee considered this to be the perception of other stakeholders.) These comments also suggest negative feeling toward the fee/cost system (one stakeholder identified the purpose of BAHA as being to 'tax the private sector', see Figure 6.3).

It can be seen in Figure 6.11 that the extent to which positive and negative perceptions of BAHA have been identified varies slightly across the different stakeholder types. Representatives from producers associations, NGOs and the private sector were more positive than negative about BAHA, though in the case of the private sector there were a relatively high number of negative responses. Perceptions were more mixed amongst BAHA staff and government officials.

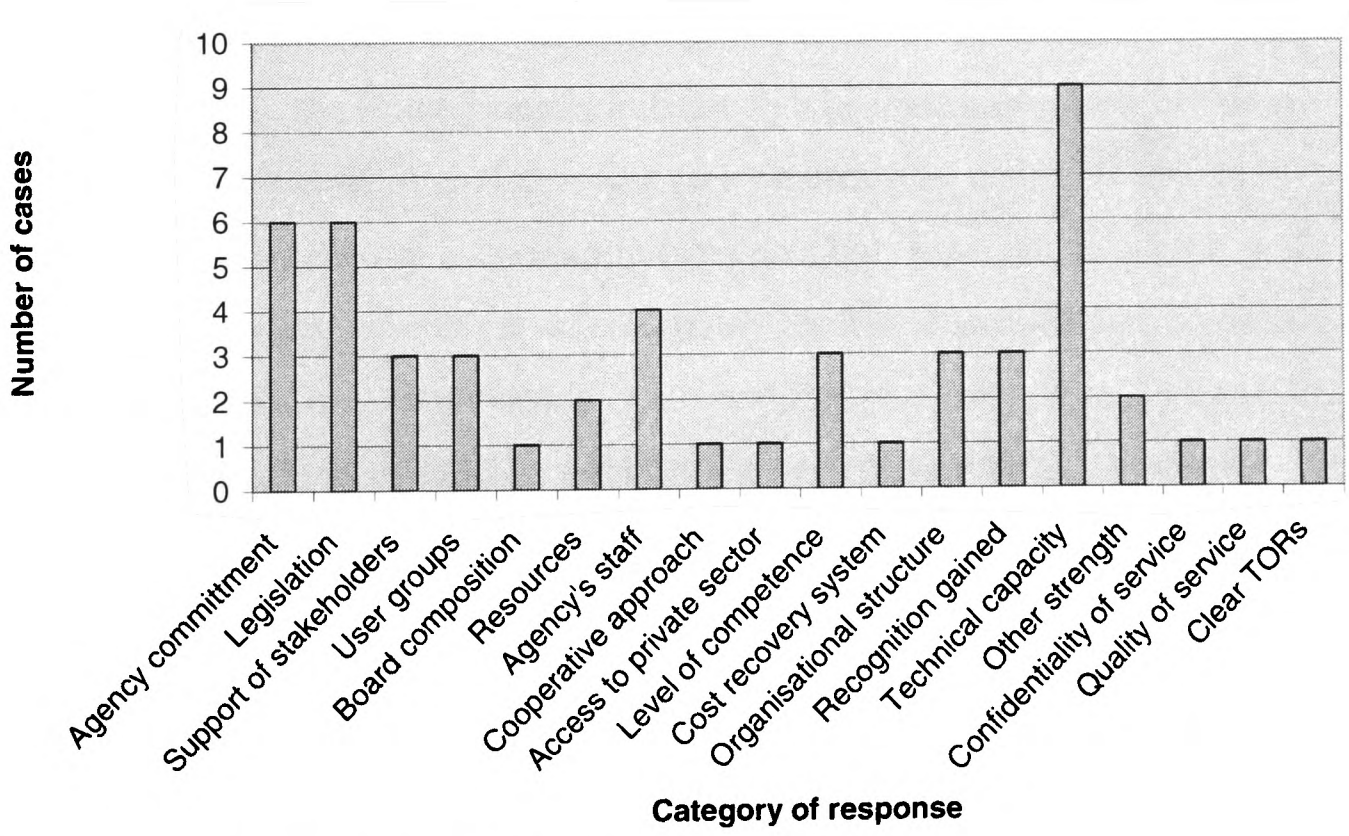


Figure 6.14: Strengths of BAHA (totals)

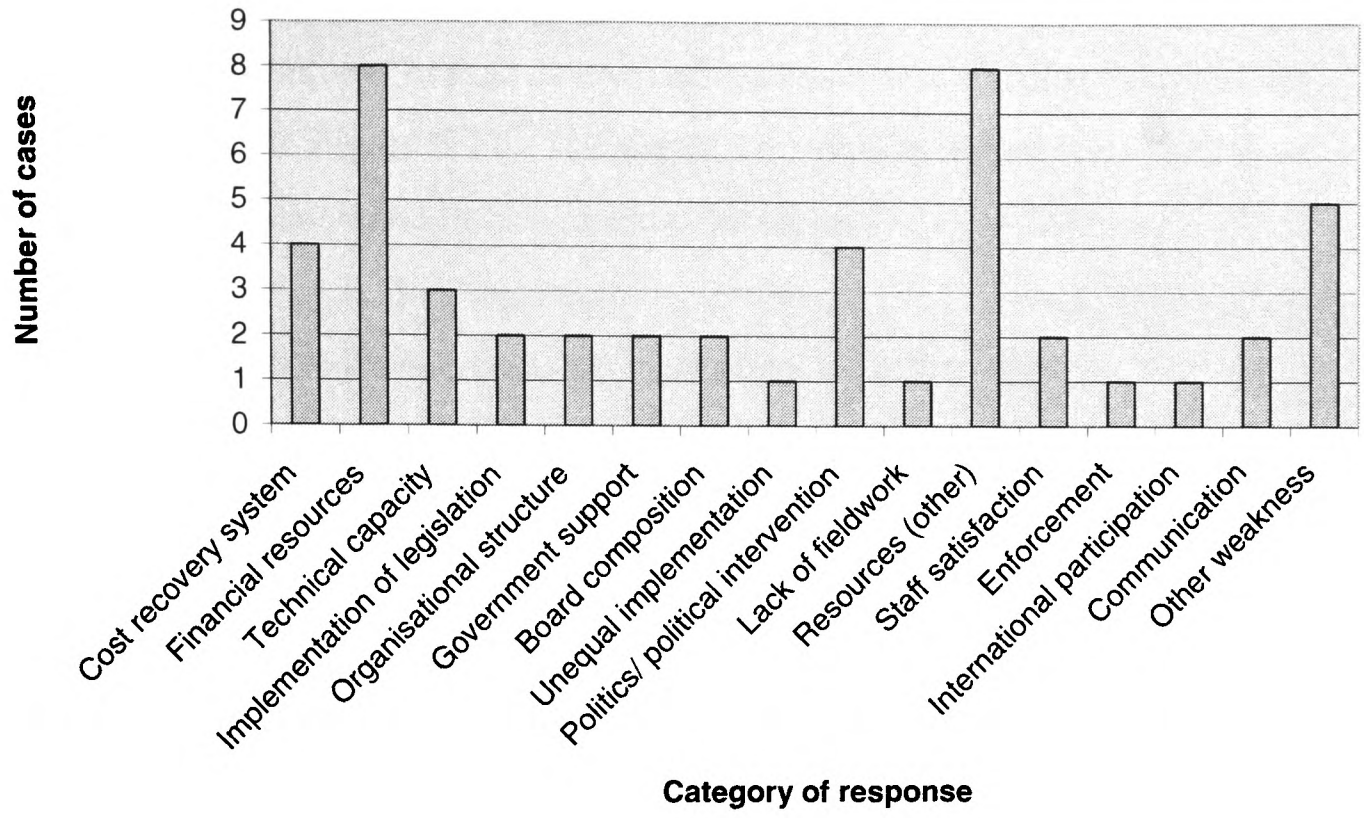


Figure 6.15: Weaknesses of BAHA (totals)

Some of the issues coded as positive and negative perceptions are seen again as strengths and weaknesses. The same piece of text in a transcript was not coded simultaneously under both categories (e.g. as a strength and a positive perception), though these issues may have been commented on at different times in the interview and might then be coded under both categories. In terms of 'strengths' and 'weaknesses', the findings again indicate that in some cases there are mixed perceptions of the same or similar issues (see Figures 6.14 and 6.15, above). 'Resources' were coded as a strength in two cases but 'financial resources' and 'resources' generally were the most commonly identified weaknesses, both coded in eight cases. 'Agency commitment' was identified as a strength in six cases, but 'staff satisfaction' was coded as a weakness in two cases. Where 'technical capacity' is coded as a weakness (three cases), the responses refer to analysis and diagnostic capabilities. Where it is coded as a strength (nine cases) responses refer primarily to the technical knowledge and ability of BAHA staff. Positive perceptions of BAHA staff can again be seen—the 'agency's staff' was coded as a strength in four cases.

Comments on the cost-recovery are seen again; the system was specifically identified as a weakness in four cases. The system is perceived to be a strength in one case. (See also Figure 6.27). The use of user groups is also identified as a strength in three cases and in one case the 'co-operative approach' of BAHA is identified as a strength. The legislation itself was coded as a strength in six cases (Figure 6.14). The legislation was not coded as a weakness, but the **implementation** of the legislation was (two cases). (Further perceptions of the legislation can be seen in Figures 6.18–6.19).

The involvement of the Government can be seen as an issue in Figure 6.15. The level of Government support was coded as a weakness of BAHA in two cases (see also Figures 6.45–6.47). 'Politics/political intervention' was coded as a weakness of BAHA in four cases.

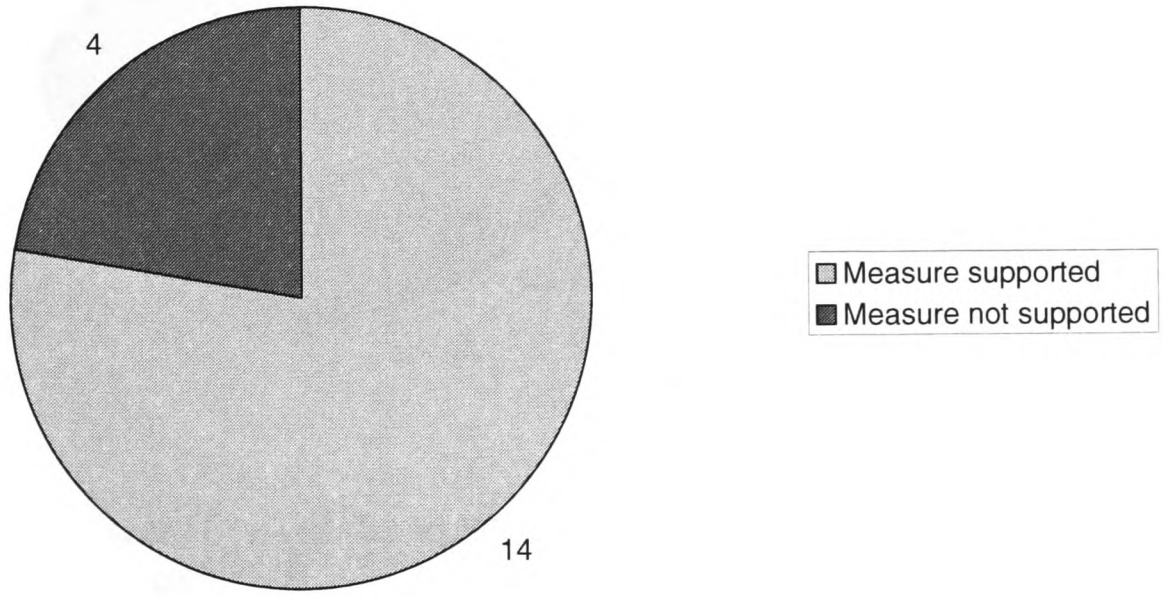


Figure 6.16: Support for agricultural health measures (total number of cases)

In almost all interviews some specific measure was identified (though they were not necessarily associated with the legislation) (Figure 6.7) and in the majority of cases, these measures were supported. These perceptions apply to the specific

measures identified, and not to perceptions of measures and controls on a general basis. (Figures 6.18–6.19 present perceptions of the legislative framework, including further perceptions of the support that exists for measures.) The most common response in terms of support for measures is support for the prevention and control of pests and diseases (identified clearly in eight cases by various stakeholder types.) A distinction was not always made between plant and animal pests and diseases but both types were referred to. Three of the responses coded as 'measures not supported' include negative perceptions of import controls. These negative perceptions were usually attributed to the private sector (three cases). 'Measures not supported' was also coded in one case for NGOs/regional bodies.

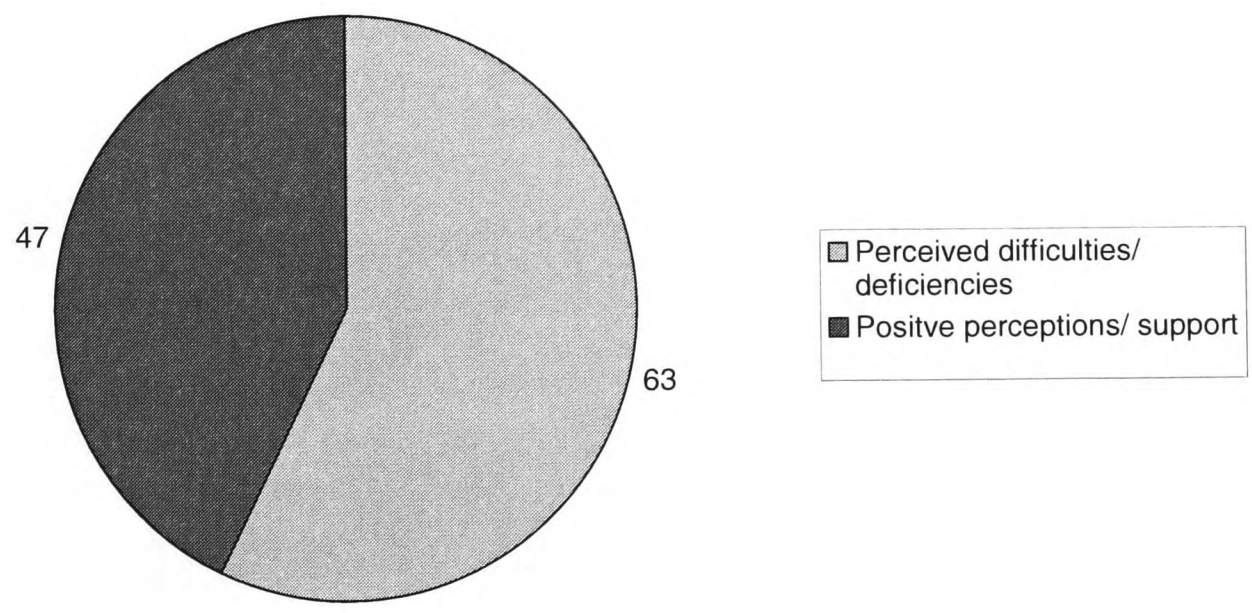


Figure 6.17: Perceptions of the legislative framework (total code frequencies by case occurrence)

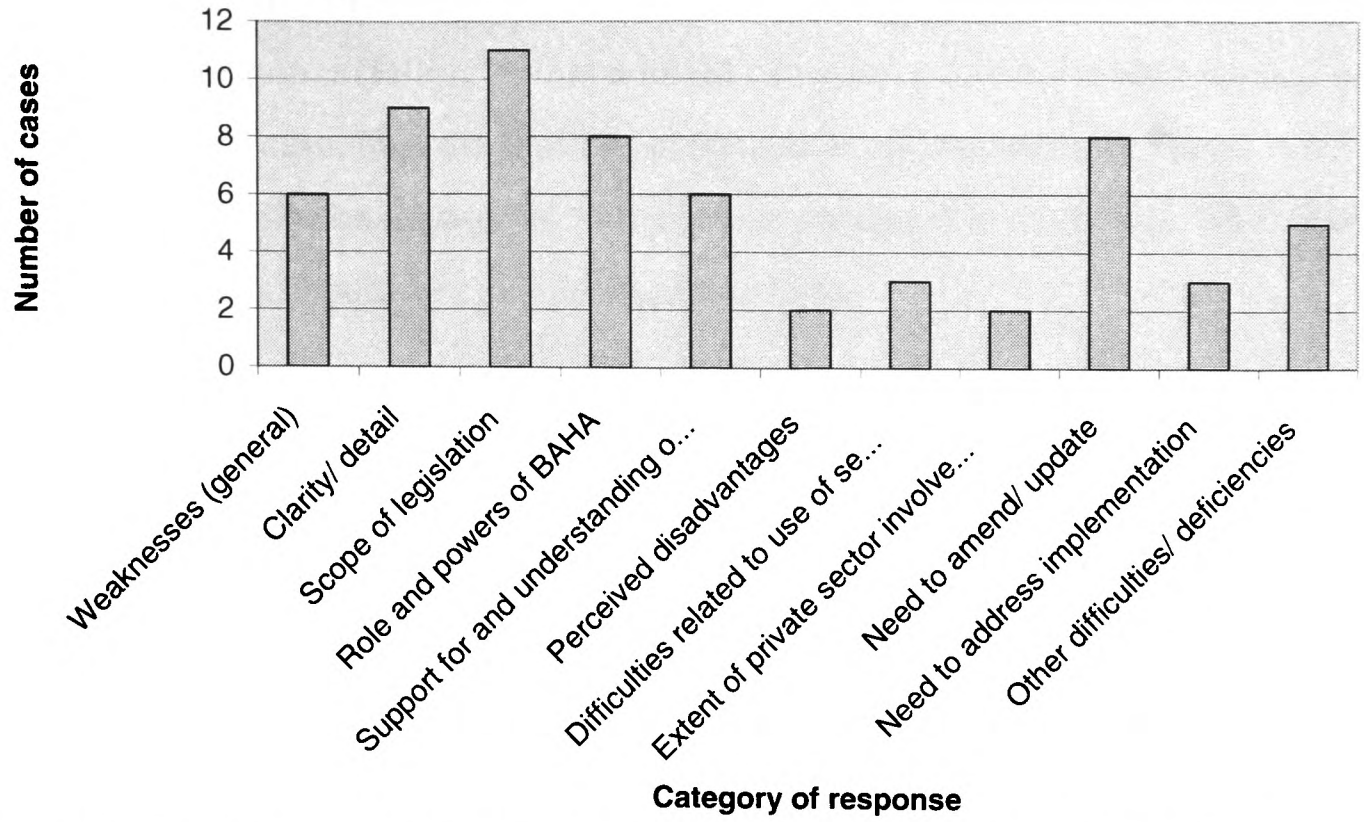


Figure 6.18: Perceived deficiencies in the legal framework (totals by broad grouping)

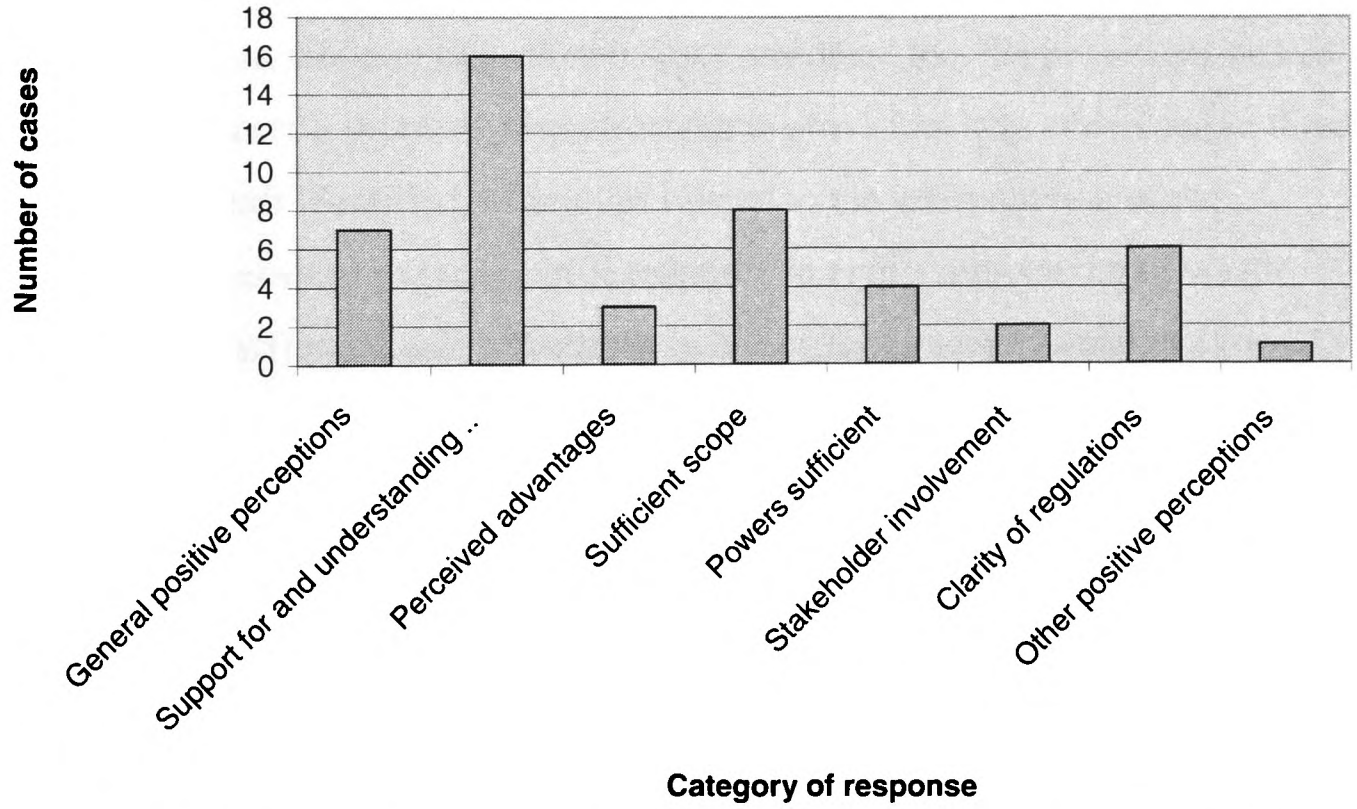


Figure 6.19: Perceived strengths of the legal framework (totals by broad grouping)

Figures 6.17–6.19 show the perceptions of the legal framework identified through grounded theory coding. Figure 6.17 displays the overall perceptions of the framework in terms of identified strengths and deficiencies, based on the case

occurrence for each broad category of response. It should be noted that more than one specific response (falling within a broad category) could have been applied in within the same case, thus the findings presented in the Appendix 7, Tables A7.2 and A7.3, should be examined, as well as those presented in the figures here, and frequency counts should be considered in this light.

Perceived strengths and deficiencies of the legislative framework specifically are almost evenly mixed (Figure 6.17). The categories 'difficulties related to the use of secondary legislation' 'need to amend/update' and 'need to address implementation' all appeared as deficiencies in the legislative framework but not as strengths. The other categories appeared as both deficiencies and strengths.

In several of the categories seen in Figures 6.18 and 6.19 there was no obvious distinction between the content of the contrasting responses. For example, in terms of the clarity of provisions, responses were provided mostly by BAHA staff. Five members of BAHA staff considered that the legislative provisions were sufficiently clear, while in two cases it was considered that the provisions lacked detail, in two cases a problem of unclear/vague provisions was coded and in three cases BAHA staff identified difficulties related to the interpretation of the provisions. In terms of the scope of legislation, in eight cases (seven of which were BAHA staff) there was considered to be sufficient scope, while in eleven cases, (seven of which were BAHA staff), problems were identified with the present scope of the legislation. Other issues including the extent to which stakeholder/private sector participation was sufficient, perceived advantages and disadvantages, and general positive perceptions and general weaknesses were coded evenly or with a difference of one case.

'Support for and understanding of' legislative provisions was coded as a strength of the legislative framework on sixteen occasions, though it was coded as a deficiency on six occasions. All but one of the comments on this deficiency were made by private sector interviewees and indicated that the purpose of measures was either unclear or not supported (though responses coded as 'lack of support

for framework' referred to support from the Government, see Appendix 7, Table A7.2).

The cause of these contrasting perceptions of the legislative framework is unclear. There does not appear to be a significant gap in the perceptions of these areas by stakeholder type. The exception is perhaps with BAHA staff who identify deficiencies more frequently than strengths overall (see Appendix 7, Tables A7.2 and A7.3). This does, however, include the areas which appear only as deficiencies and not as strengths. There is also no clear distinction based on the area of regulation (plant health, food safety etc). The issues are commented on most frequently by BAHA staff who are probably the stakeholders best placed to comment on the content and internal workings of the legislation.

In one particular area the apparently conflicting perceptions do, in fact, relate to slightly different issues. In terms of the powers of BAHA, it can be seen that four members of BAHA staff considered the powers of BAHA to be sufficient but six members of staff considered the 'role and powers' of BAHA to be a problem or deficiency. Where the role and powers of BAHA were coded as a 'deficiency' in the framework these related to the involvement of other ministries (with overlapping mandates) and the Minister for Agriculture, rather than to the regulatory powers available to BAHA *per se*. (This issue is seen elsewhere, for example, Figures 6.12, 6.15, 6.20 and 6.50).

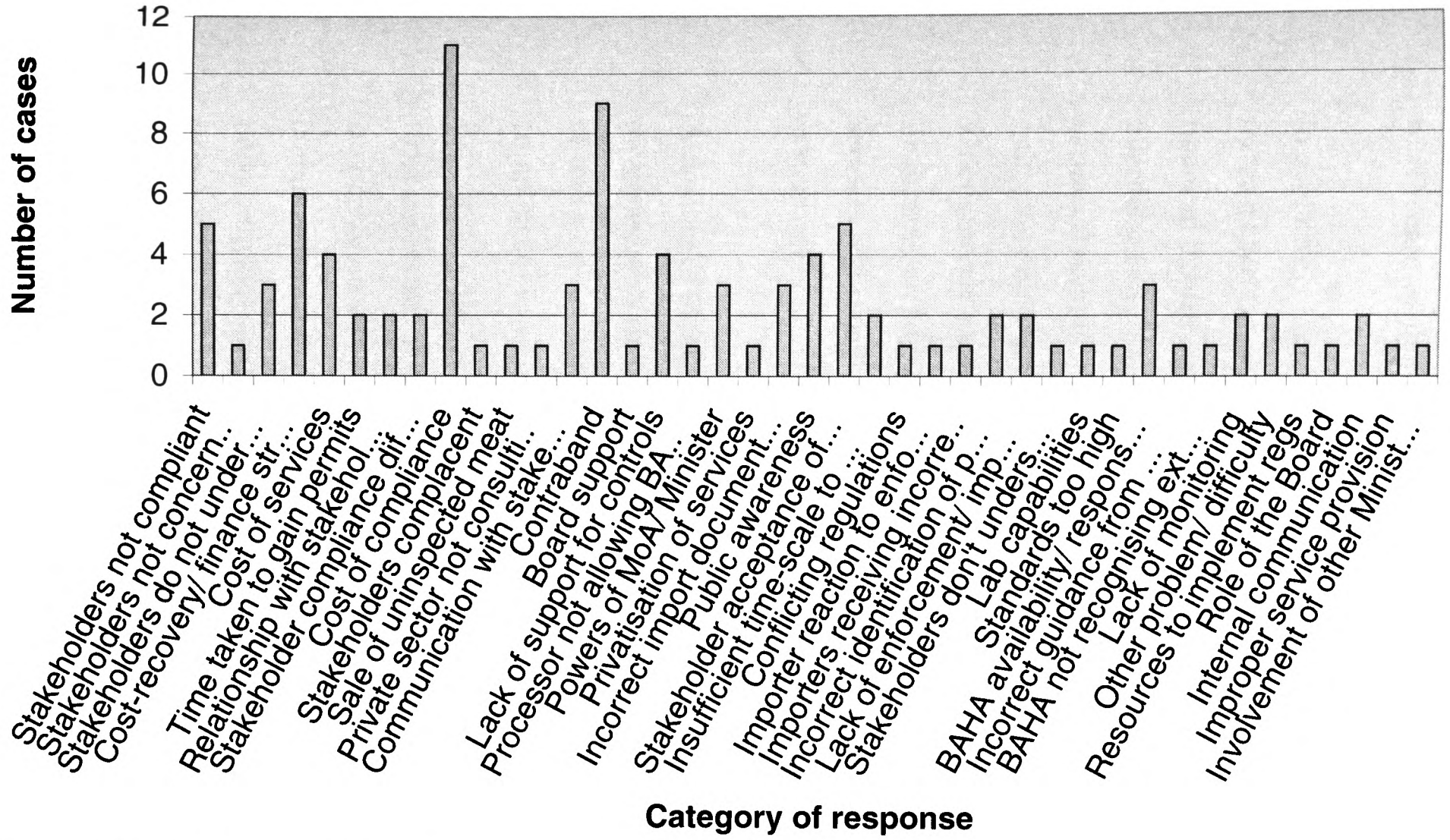


Figure 6.20: Problems within the agricultural health framework (totals)

Specific problems occurring within the framework, as identified through grounded theory coding, can be seen in Figure 6.20. A broad range of specific problems were identified though most occurred in only one or two cases.

In a relatively large number of cases identified difficulties and problems related to the costs and finance structure of BAHA. The cost of compliance, in terms of the financial burden on the private sector and the cost of making necessary improvements was the most commonly identified problem, coded in 11 cases by various stakeholder types. This relates, however, to the general cost of compliance rather than only to the cost-recovery issue. In six cases comments were made which directly related to the 'cost-recovery/finance structure' and concerned the limitations on both BAHA and, to a lesser extent, the private sector. The cost of services and stakeholder acceptance of fees (following the previous, subsidised, system) were identified as problems in four and five cases respectively.

A number of identified problems related to stakeholder attitudes and levels of awareness and support for the framework. As well as stakeholder non-acceptance of fees (above), 'stakeholders not understanding risks' (associated with non-compliance) was coded in three cases and, (lack of) public awareness was coded in four cases. Other problems within this area include 'lack of support for controls' (four cases) and several other specific issues indicating problems with levels of support or awareness each identified in one case. Problems related directly to non-compliance and to difficulties with compliance were also identified. A problem of non-compliant stakeholders was identified in five cases, the problem of 'contraband' was coded in nine cases. Also identified in this context were the sale of uninspected meat (not subject to BAHA's inspections and controls) (one case) and problems with importers arriving without the proper documentation (three cases).

The interaction between BAHA and other stakeholders and the provision of services by BAHA were also issues — problems with the 'availability/response [of BAHA] to stakeholders', 'lack of monitoring', 'lack of

enforcement/implementation', 'communication with stakeholders' and '[BAHA's] relationship with stakeholders' were all identified as problems in two or three cases. 'Incorrect guidance from BAHA' was coded in one case. The three cases commenting on the availability of services were private sector stakeholders: two of these were not involved with export and one was involved with export indirectly (a citrus farmer selling to a Belize buyer, for export).

The role of the Government and Ministry is again present in a few cases: 'powers of the MoA/Minister' was coded as a problem with the framework in three cases (see also Figure 6.50). Other administrative and organisational problems for BAHA staff include the level of support of the Board, 'privatisation of services', 'conflicting regulations', the 'role of the Board' (each coded in one case) and 'internal communication' (two cases).

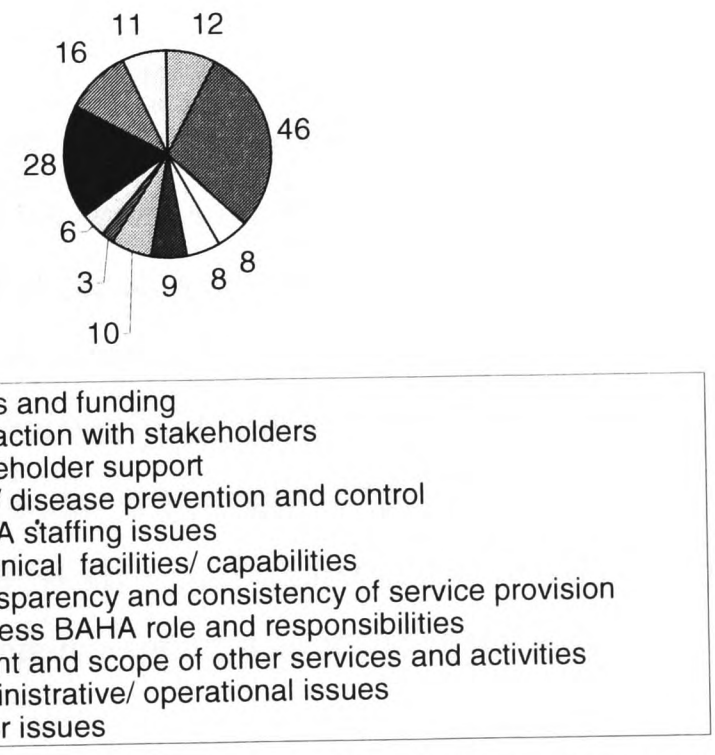


Figure 6.21: Issues identified as requiring attention (by broad grouping)

Specific comments concerning issues perceived to require attention, or which need to be addressed, were coded through grounded theory analysis and were grouped into broad categories. It should be noted however, that several of the specific comments overlap and Figure 6.21 is only indicative of the breakdown of responses. The full list of responses and frequency counts (by case occurrence) can be seen in Appendix 7, Table A7.4.

The issues identified in Figure 6.21 highlight a need for BAHA to increase their interaction with stakeholders and to extend the scope of their activities, including further field/extension services (see also Figure 6.29). Specifically, the need to educate stakeholders was by far the most commonly identified of any of the issues and was coded in 21 cases (45% of all stakeholders interviewed). The need for BAHA to increase the amount of dialogue and consultation with stakeholders and the need for BAHA to increase its collaboration with third parties were the next most common responses in this group (identified in six and eight cases respectively). The extent and scope of BAHA's activities and services was the next most commented on group. There was an identified need for BAHA to become involved with, or increase their involvement with, fieldwork or extension activities (coded in 5 cases). Other responses within this group covered a range of specific areas in which stakeholders considered that there was a need for the extent and scope of activities and services to be addressed. Two cases, however, questioned whether the present broad scope of activities should be reduced.

Administrative and resource issues were also identified as needing to be addressed, particularly the need for an increase in BAHA's personnel which was identified in nine cases. Technical capacity was also an issue: the need to improve BAHA's laboratory facilities was identified in seven cases with the need to improve quarantine facilities specifically identified in three cases (both grouped under 'technical facilities/capabilities'). The need to improve the technical capacity of staff (grouped under 'BAHA staffing issues') was identified in six cases. The need to gain Government support was coded in three cases.

Another area identified as requiring attention or needing to be addressed was the cost recovery and financial system including the need to address costs to stakeholders and to review funding arrangements (identified in five and two cases respectively, see Appendix 7 A7.4).

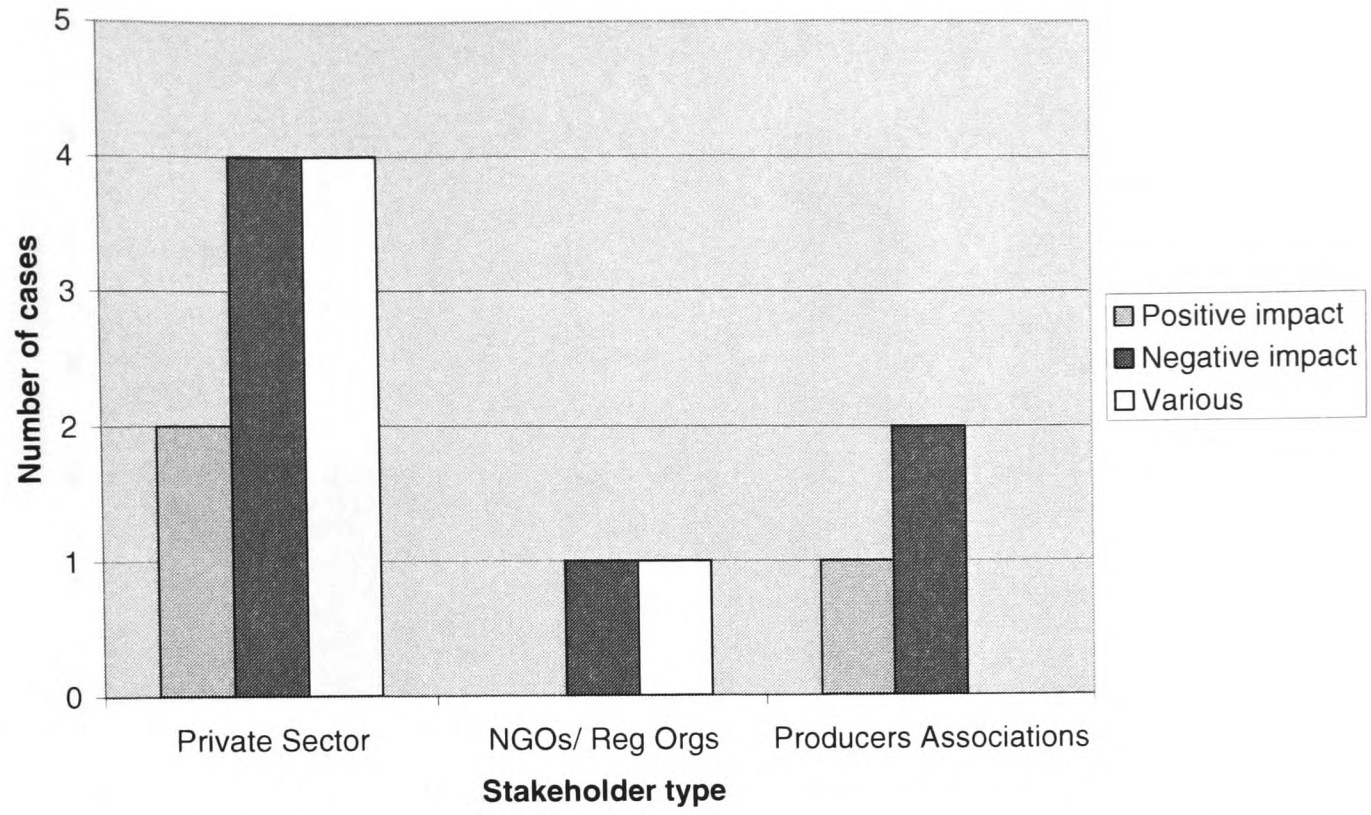


Figure 6.22: Perceived impact of framework on private sector (by stakeholder type)

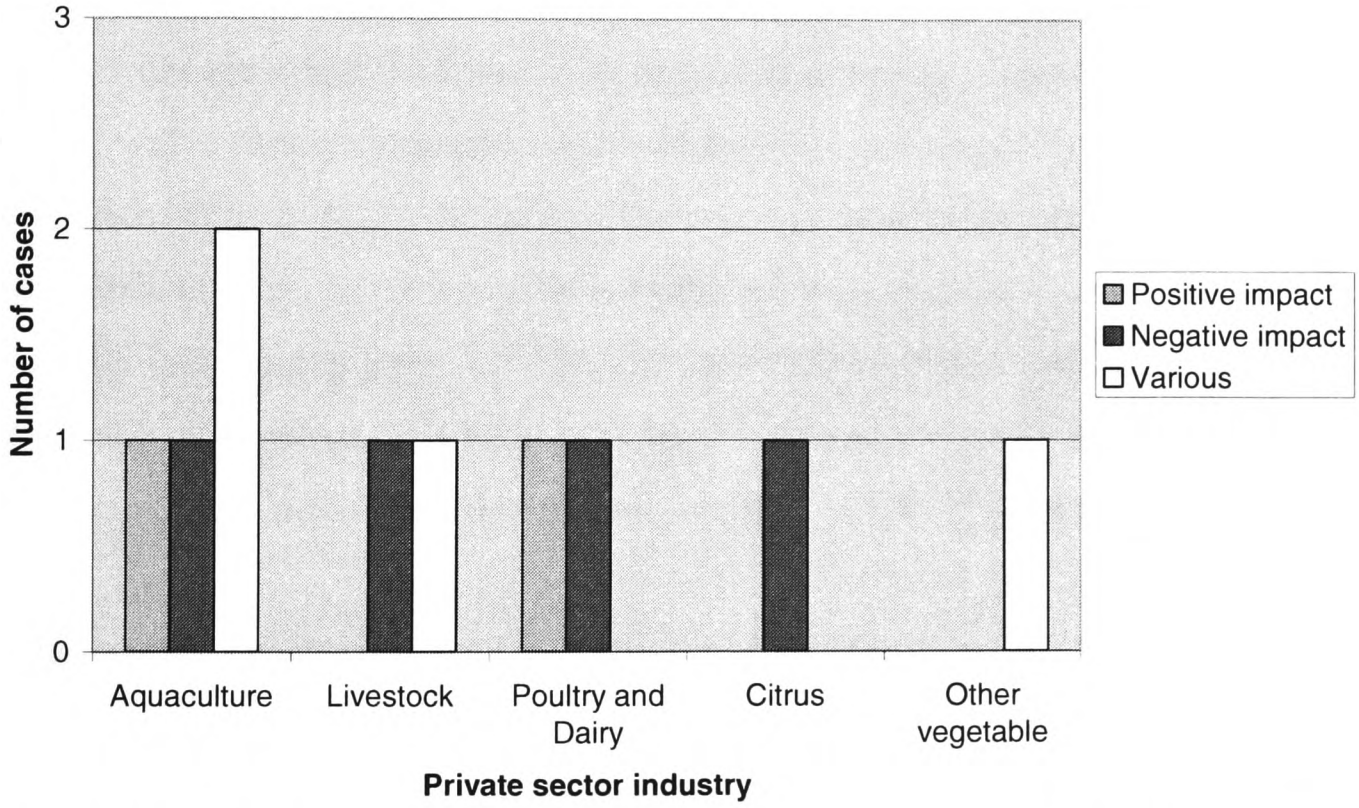


Figure 6.23: Perceived impact of framework on private sector (by industry type)

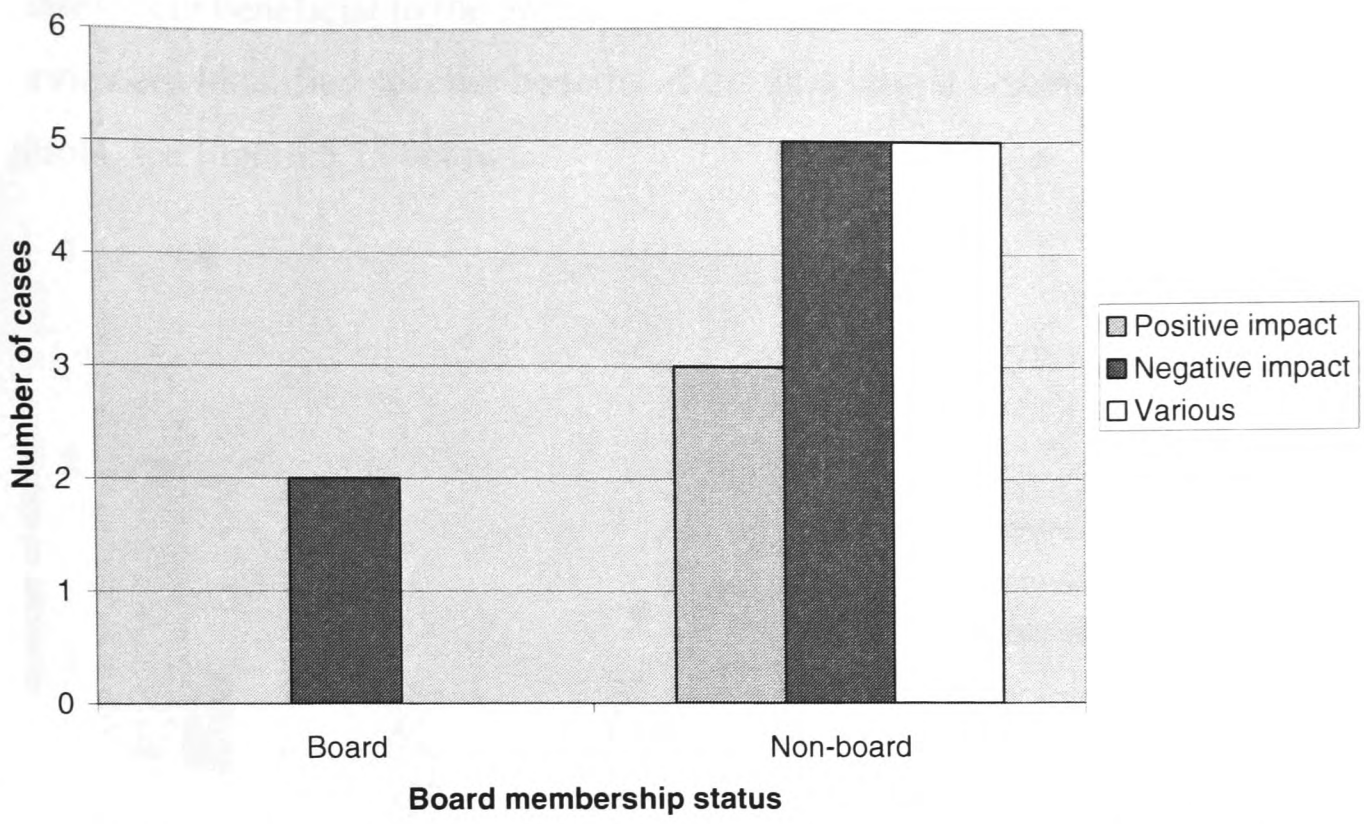


Figure 6.24: Perceived impact of framework on private sector (by Board membership status)

The impact of the framework on the private sector is seen in both positive and negative terms. Responses were coded for 32% of interviewees. Seven interviewees identified the framework as having a 'negative impact on the private sector', with a further three perceptions of negative impacts coded under 'various' perceptions (Figure 6.22). Several of the negative perceptions came from private sector stakeholders. Negative impacts identified were that the framework is generally impeding or preventing private sector development and that the costs involved have a detrimental impact on the private sector. In four cases these negative impacts were identified as applying to small-scale farmers.

In three cases a positive impact was identified. In cases in which 'various' impacts were coded, three further positive responses were identified. Most commonly, positive responses were identified by the aquaculture industry. One livestock producer, one poultry/dairy producer and one 'other vegetable' producer/processor (an exporter) also identified positive impacts. Positive impacts identified were that the measures and controls in place are beneficial to producers/processors in helping them to meet or maintain standards, that the controls have a positive impact on private sector processes and activities and that controls on pests and

diseases were beneficial to the private sector. (Also, in eight cases private sector interviewees identified specific benefits of the agricultural health measures and controls, see Figure 6.25 below).

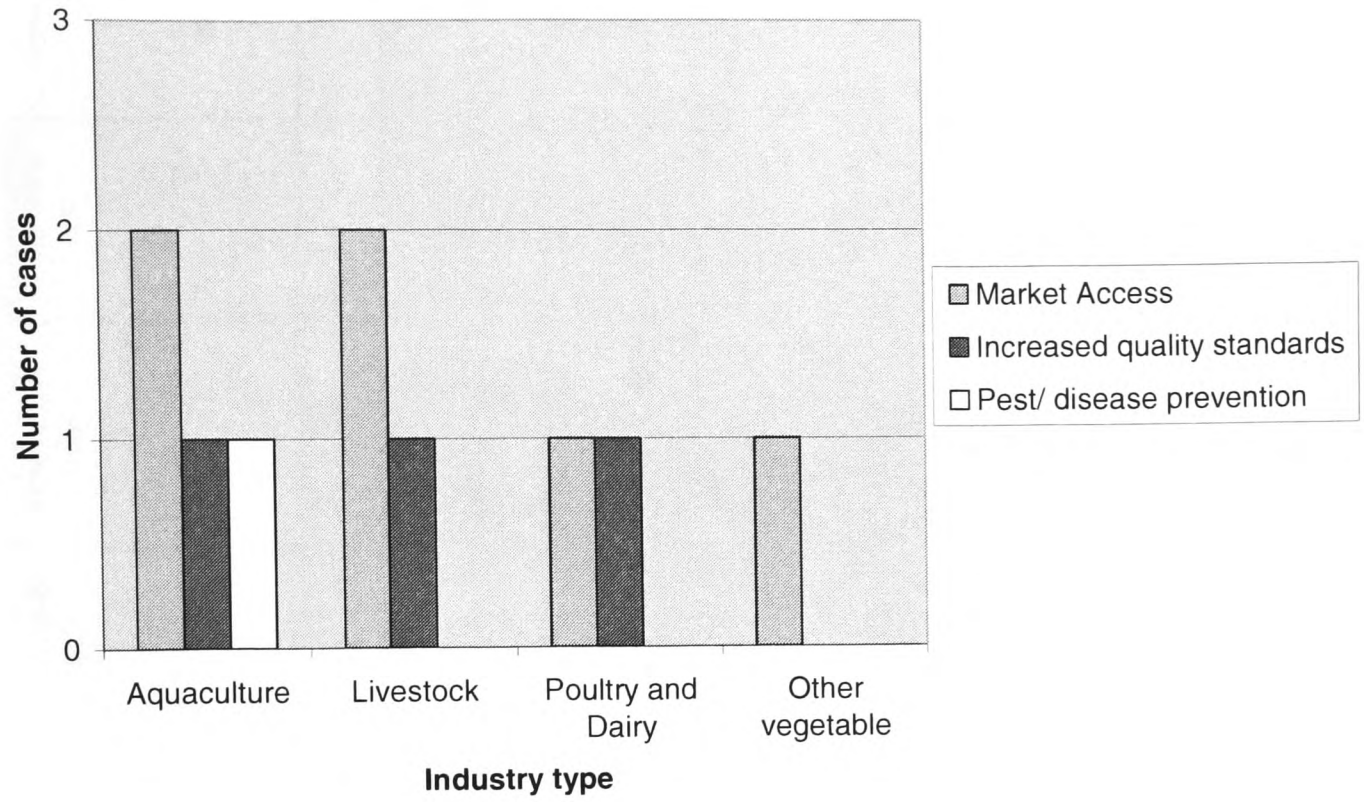


Figure 6.25: Private sector perceptions of benefits (by industry type)

Figures 6.25 and Table 6.1 illustrate benefits that private sector stakeholders identified as resulting from the controls and measures that are in place. No specific benefits were identified for the two interviewees from the papaya sector or for the three interviewees from the citrus sector. Benefits were most frequently identified by the export-based aquaculture industry. Some non-exporting producers (in the livestock and poultry and dairy industries) also identified benefits of the framework, including increased market access. Thus, while some responses suggested that there may be problems concerning the impact of the framework on small and/or non-exporting producers and processors (Figures 22–24), these stakeholders are apparently able to realise benefits from the framework on some occasions.

Table 6.1 Private sector perceptions of benefits of measures and controls (results by case)

Perceived benefit	Interview 18	Interview 29	Interview 38	Interview 39	Interview 41	Interview 42	Interview 44	Interview 45	Totals
Market Access	1	1	1	1		1	1		6
Increased quality standards		1		1				1	3
Pest/disease prevention					1				1

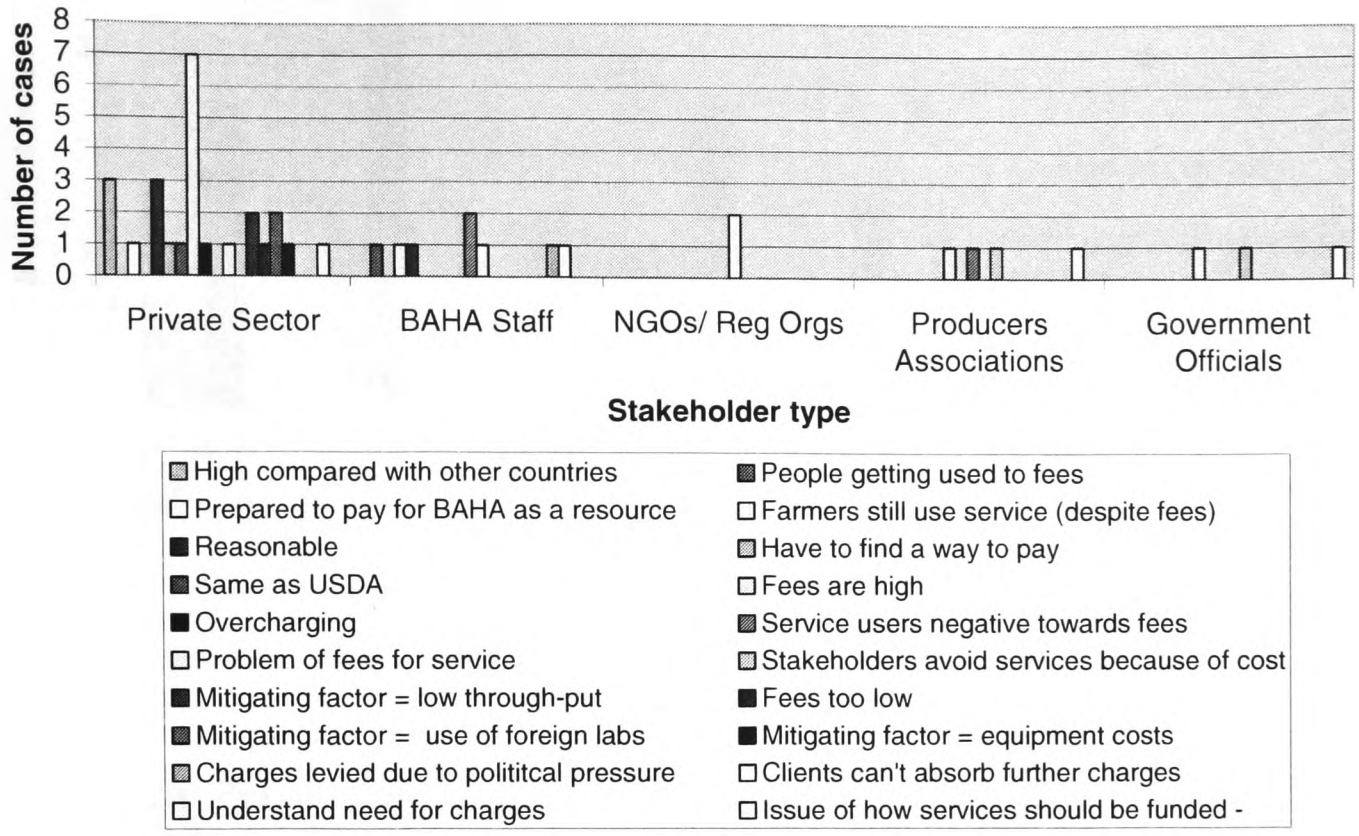


Figure 6.26: Specific perceptions of fees (by stakeholder type)

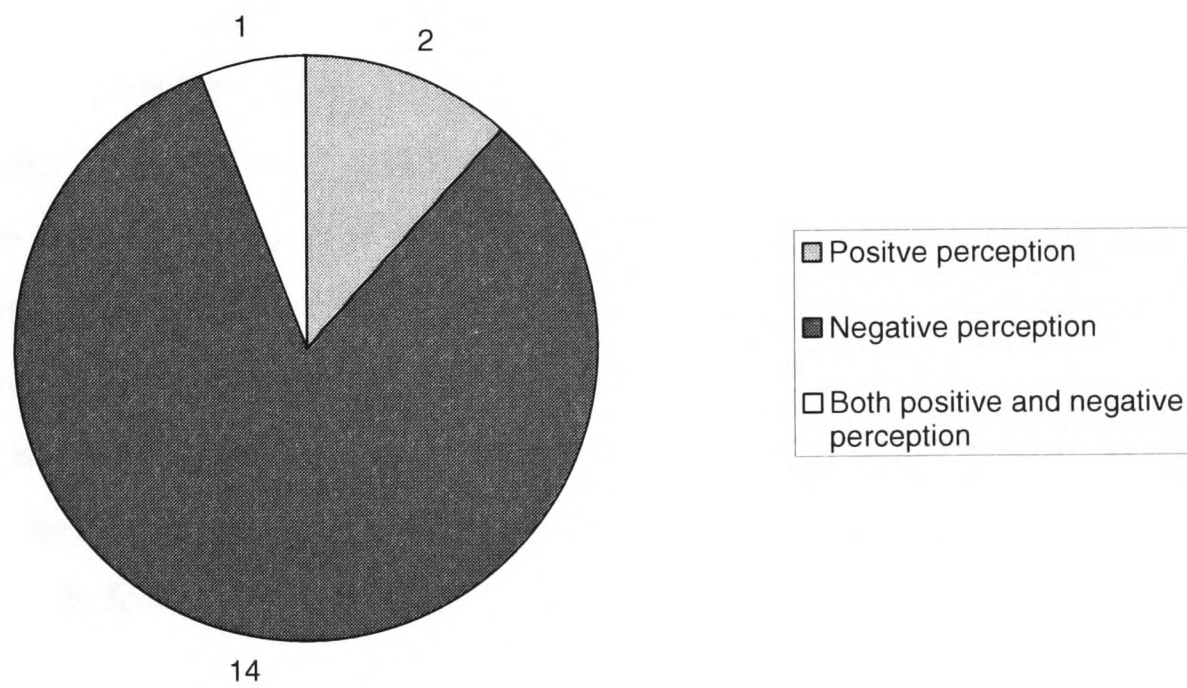


Figure 6.27: Perceptions of the cost recovery system (totals)

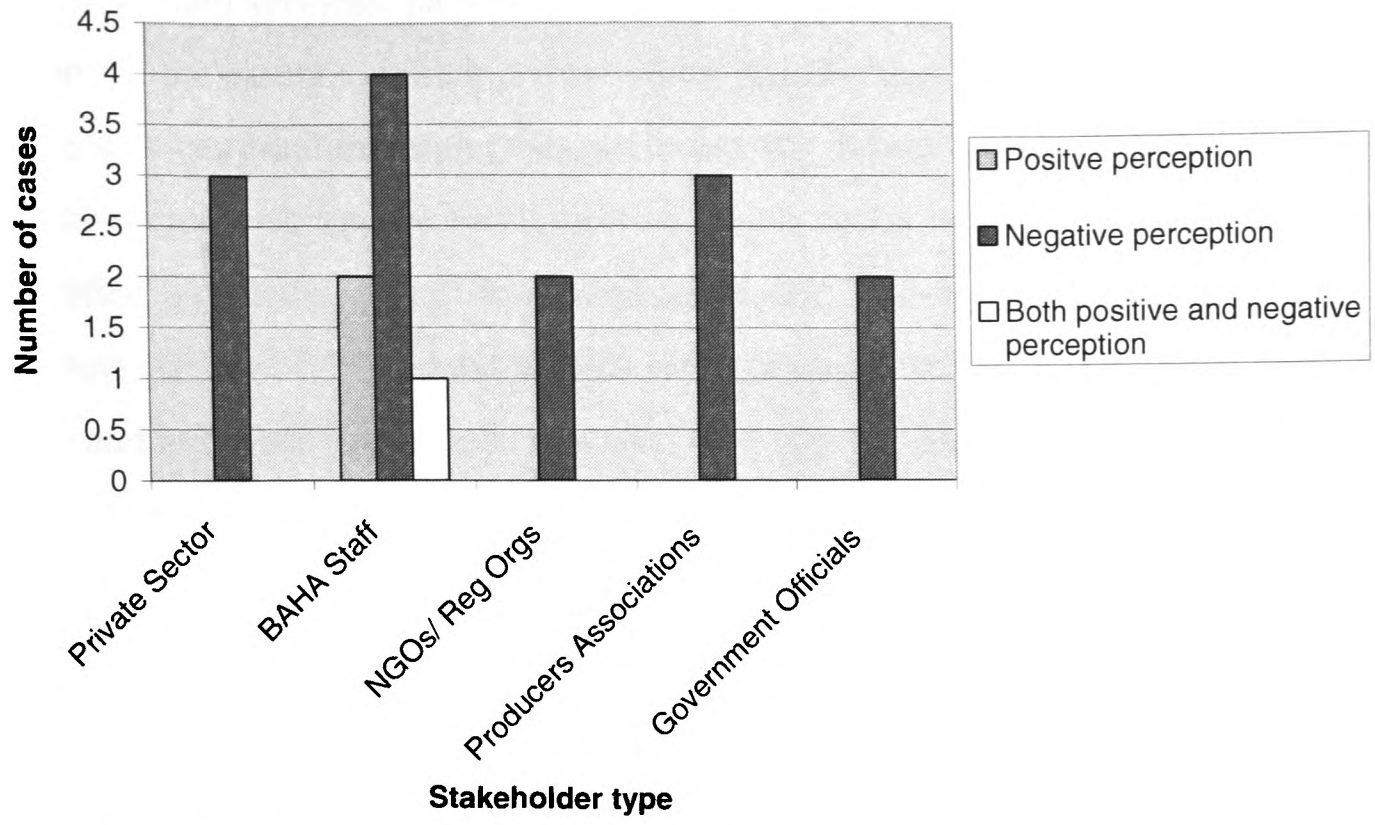


Figure 6.28: Perceptions of the cost recovery system (by stakeholder type)

Figure 6.26 shows specific comments and responses on fees, identified through grounded theory coding. The private sector commented most frequently about fees (they were specifically asked their opinions about them), and a variety of perceptions were identified, both positive and negative. The most common response was that the fees are high; this was coded in nine cases in total (19% of all interviews). As can be seen, however, in some cases 'mitigating factors'—explanations for this high level of fee, as perceived by private sector stakeholders—were identified. The data in Figure 6.25 does not suggest that private sector stakeholders generally are averse to paying fees for services received. It has been seen in Figure 12 that five private sector stakeholders were identified as holding negative perceptions of fees (these negative perceptions were coded separately from other perceptions of fees).

It can be seen that in the majority of cases (82% of responses, 30% of all cases), the cost recovery system is perceived negatively. Negative perceptions of the cost recovery system are identified firstly in terms of the extent to which BAHA is able to implement particular services and programs. Stakeholders considered that under the present system the necessary resources are not always available. In some situations, stakeholders recognised that it was difficult or inappropriate to charge

fees for certain services, particularly the so-called 'public good' services. Secondly, the extent to which private sector stakeholders are able, and are willing, to use services entailing high costs, including the impact on perceptions of the private sector, was a perceived limitation. These issues were reflected also in those identified 'problems' which directly related to the 'cost-recovery/finance structure' (Figure 6.20), in the identification of the system as a 'weakness' (Figure 6.15) and in the identified need to address the cost to stakeholders and to review funding arrangements (see Appendix 7, Table A7.4).

Positive perceptions were coded in three cases. In one of these cases there was an association between the fees charged and an improvement in the level of services (compared to the previous publicly funded system). The two remaining cases identified the ability to charge for services as beneficial in being able to offer a range of services, including so-called 'public good' services. That this existed independently of control (and reduction) of public funds was also noted to be beneficial. These positive perceptions were all identified by BAHA staff (Figure 6.28).

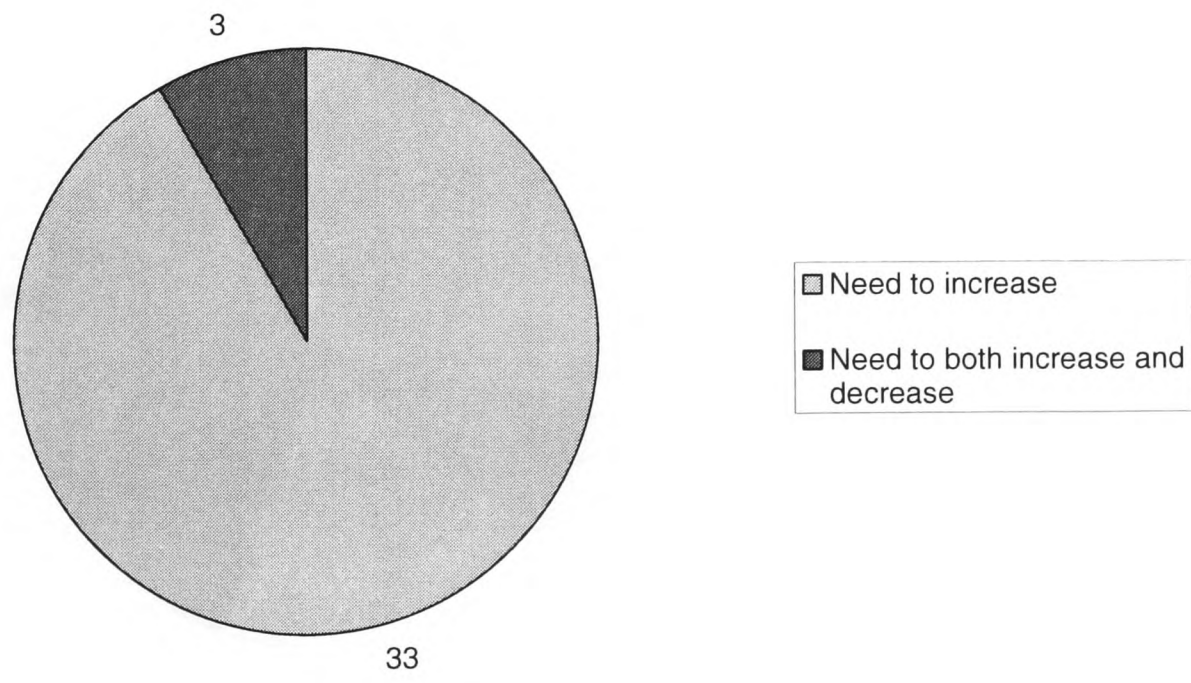


Figure 6.29: Perceptions of the extent of agency contact with stakeholders (totals)

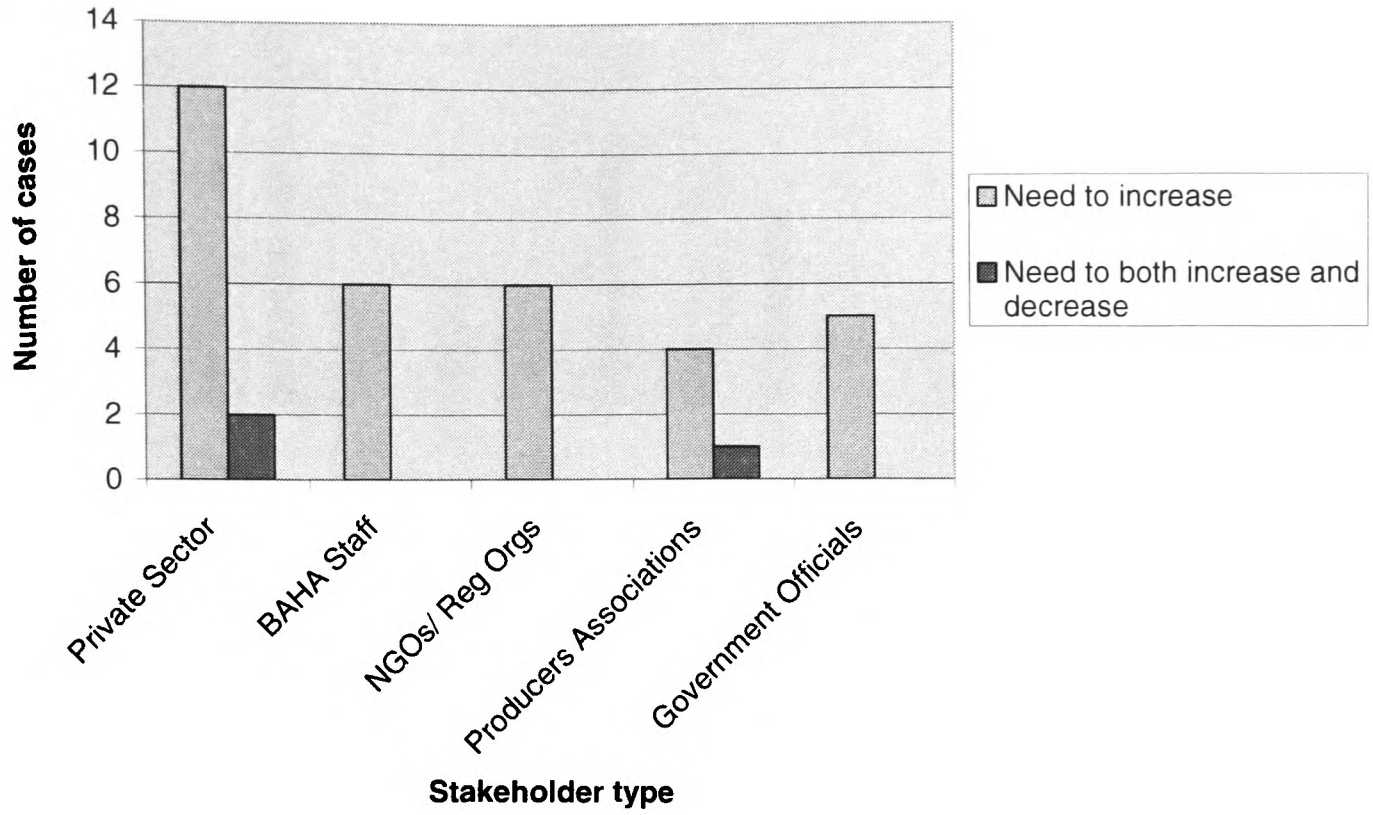


Figure 6.30: Perceptions of the extent of agency contact with stakeholders (by stakeholder type)

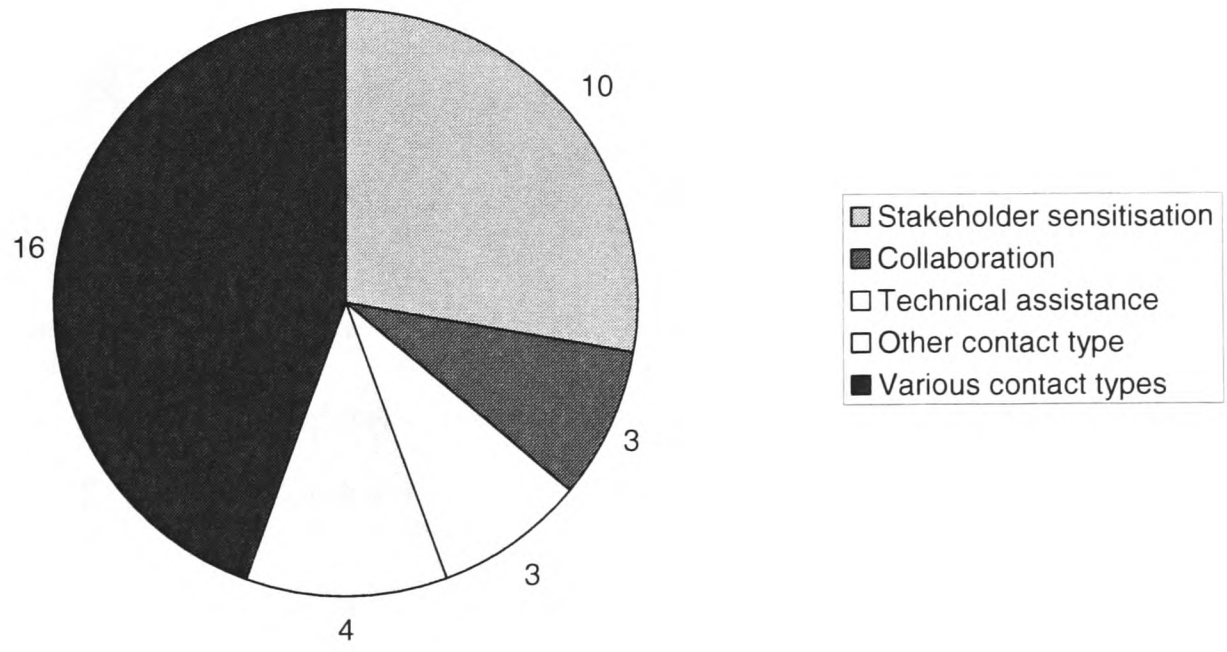


Figure 6.31: Type of contact needed (totals)

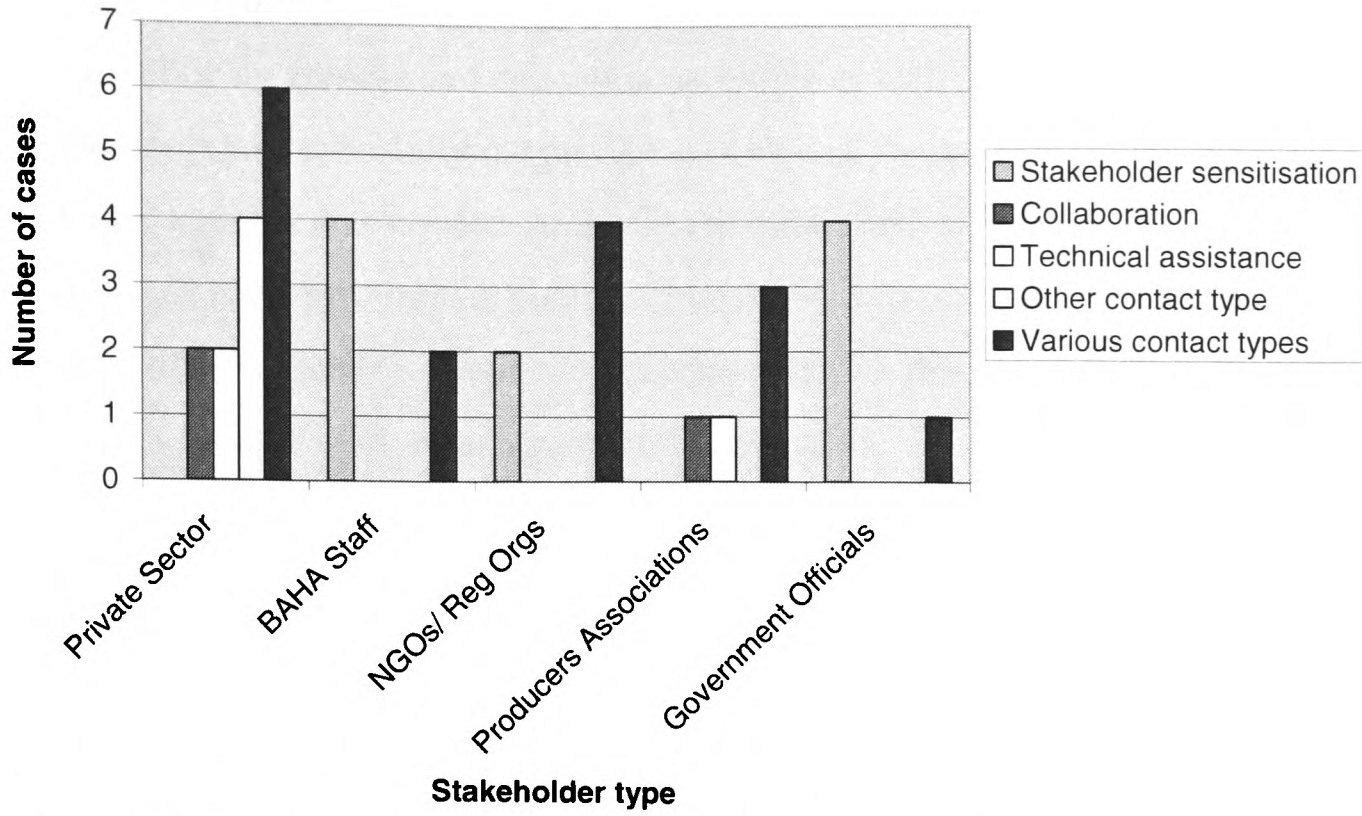


Figure 6.32: Type of contact needed (by stakeholder type)

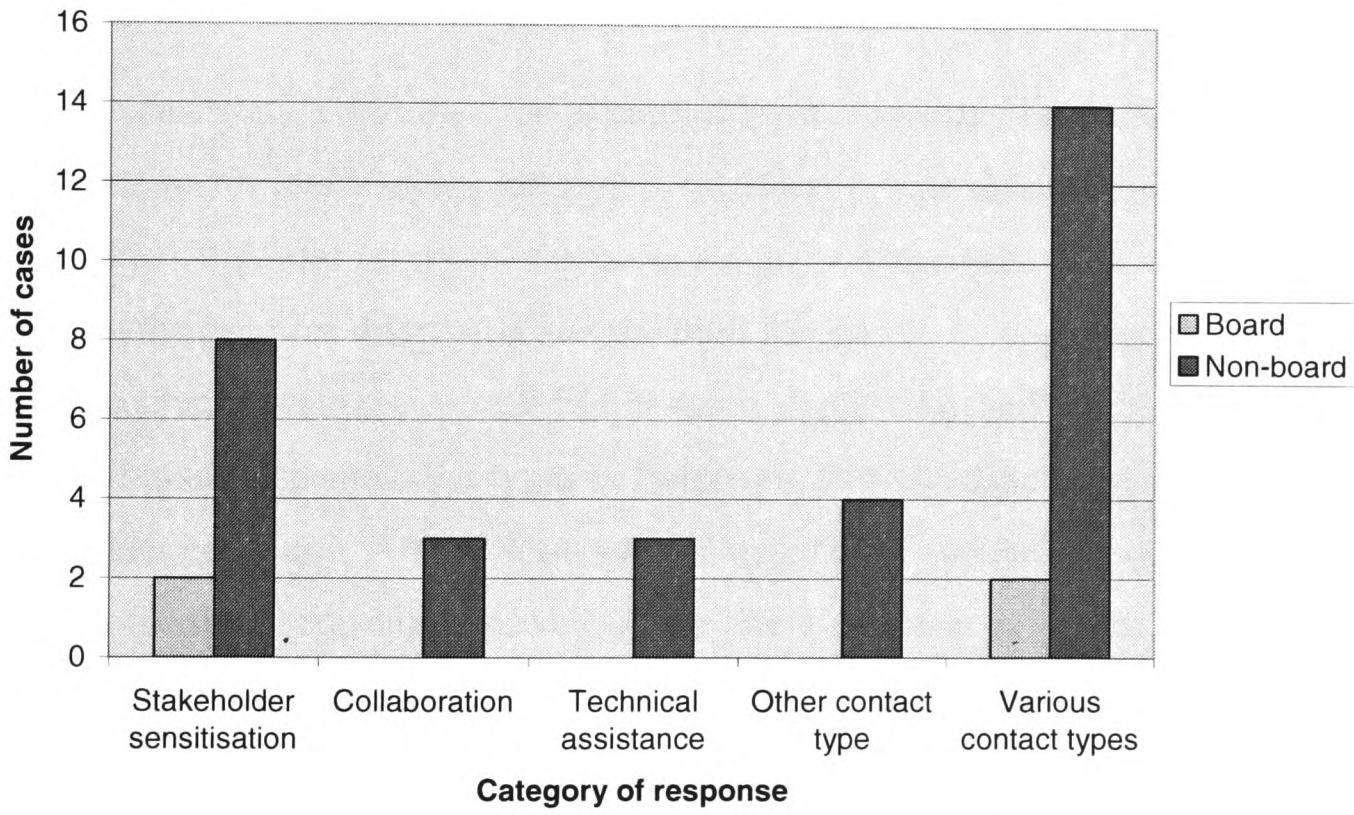


Figure 6.33: Type of contact needed (by Board membership status)

Perceptions of agency contact with stakeholders, seen in Figures 6.29–6.33, show that in the majority of cases there was an identified need to increase the extent of contact that BAHA has with other stakeholders (see also Figure 6.21). This perception was coded for all stakeholder types and for both Board and non-board members. The exception to this was BAHA staff (Figure 6.30), for which the need

was identified in less than half the cases. 'Stakeholder sensitisation' (including general public awareness and education activities as well as education of particular stakeholder types, especially the private sector) was the specific contact type most frequently identified as needed (and was also identified in the majority of cases identifying a need for 'various contact types)'. As well as a need for increased contact with stakeholders a number of coded negative perceptions related to the lack of this type of work (see Figures 6.12 and 6.20).

The need for 'collaboration' was also relevant, identified in three specific cases and several cases in which 'various contact types' was coded. Comments in this area ranged from a need to enable producers to participate in two-way communication and dialogue with BAHA, through to perceptions that these stakeholders could play a role within the regulatory framework, for example through the sharing of resources.[449]

Though sensitisation was the type of contact most commonly identified as needed, no private sector interviewees referred to this contact type solely. Private sector stakeholders did refer to 'other' contact types and, on two occasions, these were based on the need for discussion and the need for BAHA to work together with the private sector. Private sector stakeholders also identified a need for increased technical assistance and other types of fieldwork, as well as the need for stakeholder education. Although overall the majority of stakeholders emphasised a need for increased education, private sector interviewees in particular identified a need for other types of contact and focused as much on the need for two-way communication as on the need for general education, perhaps suggesting a need for these stakeholders to feel part of the regulatory process, rather than simply

---

[449] For example:
"*So what we're trying to do with BAHA and what we identified last year is that BAHA need to help organise these people and to be in constant dialogue...and then through-, throughout the entire cycle, not only when, the misconception with BAHA is that you'll call BAHA when you have a health problem...but BAHA needs to operate beyond that and one way that we've identified is through the consultation no*". (BAHA interview 13)
"*As a matter of fact I would, you know, one of the suggestions that we've made for the agriculture um I don't know, the agricultural organisation or association here...is that we actually, as, invest in BAHA and in their training and in their attending more seminars et cetera because in turn they*

receiving regulation from the top-down. BAHA staff did not identify a need for increased technical and fieldwork activities and although these were identified by the private sector in only a few cases, this again indicates a disparity between the emphasis placed on such activities by other stakeholders and by BAHA. Figure 6.9 highlighted the contact which private sector stakeholders have had with the regulatory agency.

No stakeholders identified only a need to decrease contact but in three cases there was a need to 'both increase and decrease' the level of contact. In one case the identified need to decrease contact was based on a suggestion that the presence of inspectors at facilities during the slaughter of animals could be decreased (due to limited resources). A second case also suggested that in some areas the frequency of inspection could be decreased, but in relation to industries playing an increased role in self-regulation. The third case suggested that too much effort had been put into 'convincing' the public of the need for certain measures (to the detriment of other enforcement action). Two of the three stakeholders identifying a need to decrease contact were Board members. These Board members were also the two private sector stakeholders identifying a need to decrease contact, as seen in Figure 6.30.

---

can turn around, they can help us...look, the better they are the better we'll be". (BAHA interview 22).

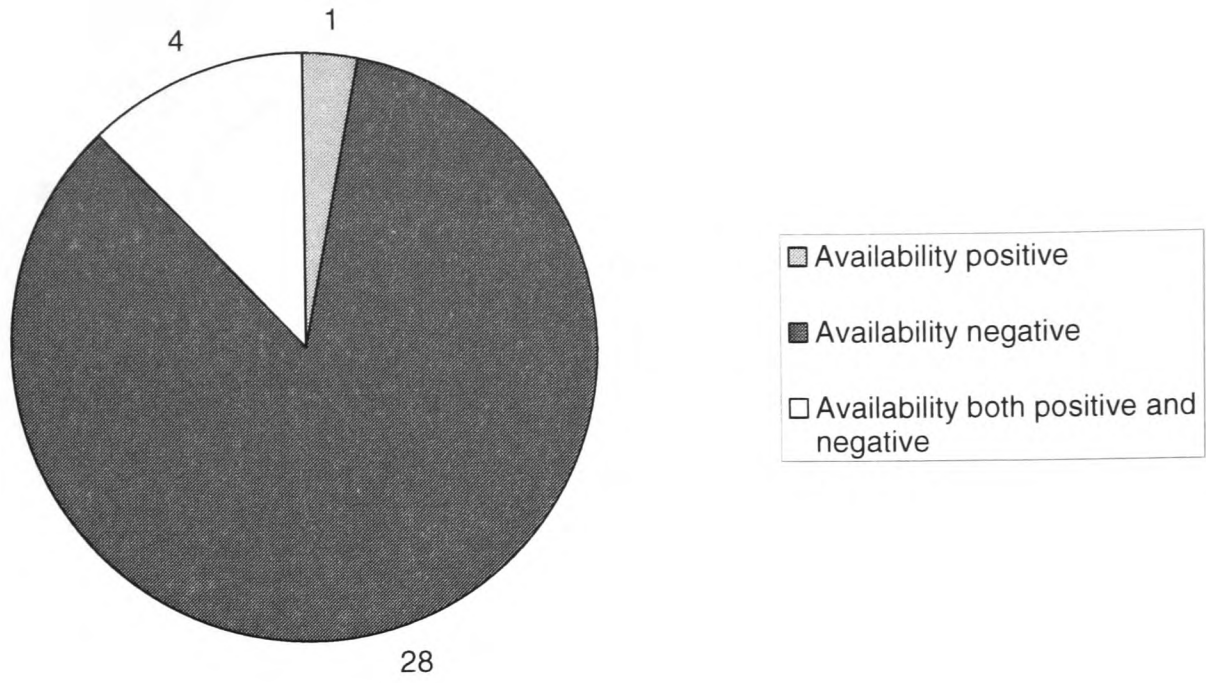


Figure 6.34: Availability of resources (totals)

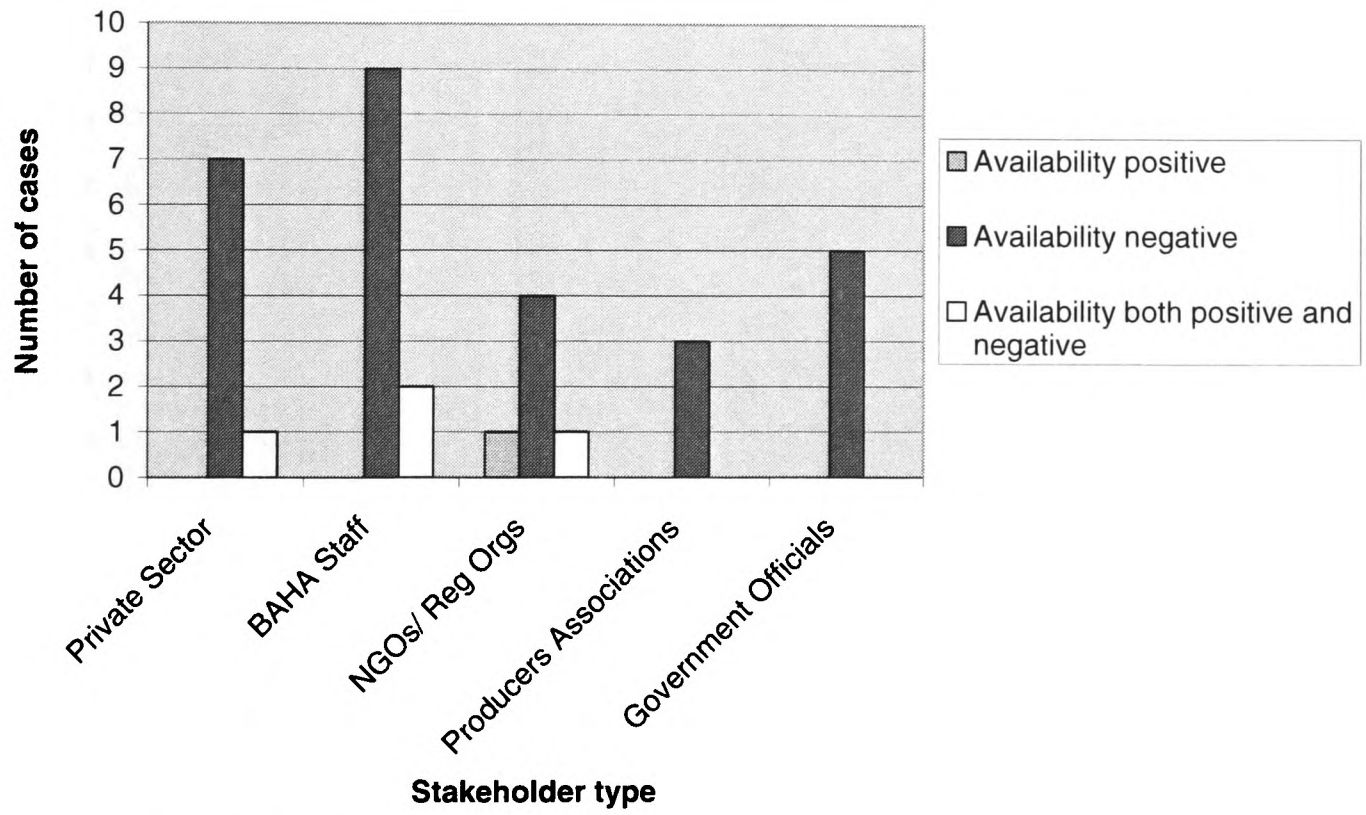


Figure 6.35: Availability of resources (by stakeholder type)

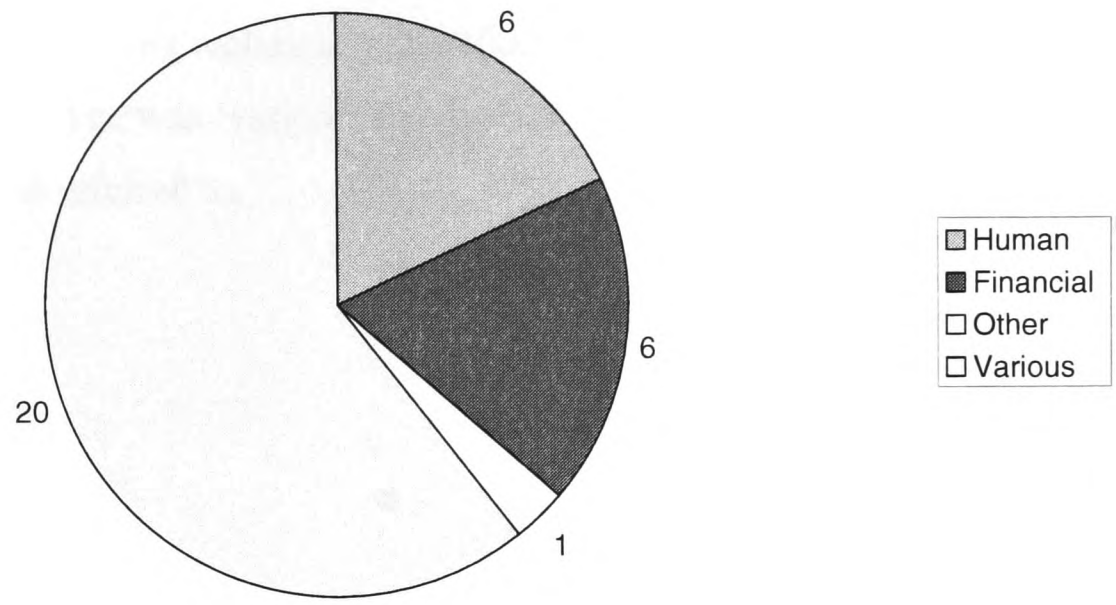


Figure 6.36: Identified resource types (totals)

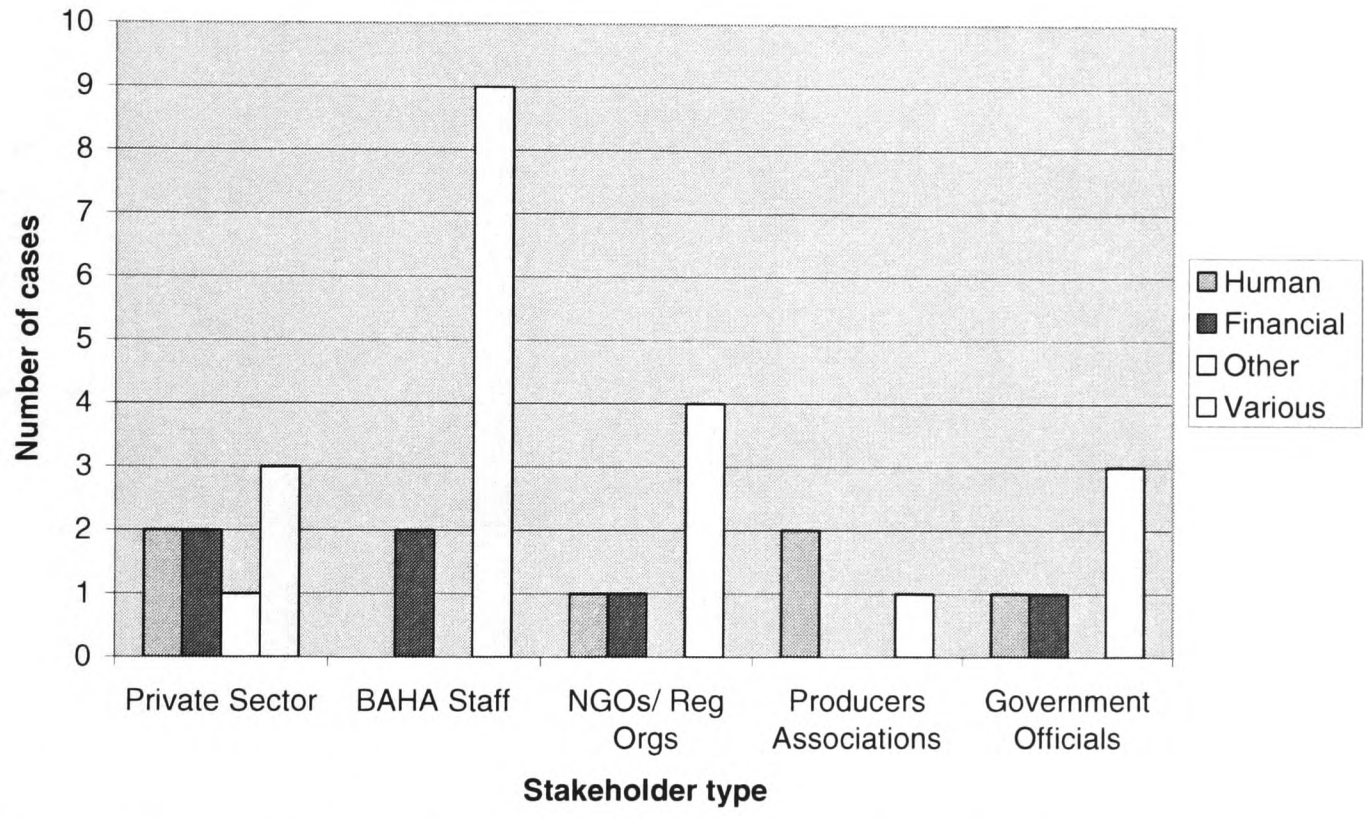


Figure 6.37: Identified resource types (by stakeholder type)

Figures 6.34–6.37 illustrate perceptions of the availability of resources. It can be seen that in a large number of cases (28 of 47 interviews, or 60%), the availability of resources was considered to be negative. These findings are reflected for all stakeholder types. In a further four cases availability was identified as both positive and negative. In one case the availability was considered to be positive.

Figures 6.36 and 6.37 illustrate the types of resource that were referred to. Positive perceptions of resource availability referred to the availability of equipment and of human resources including technically qualified personnel. The most commonly identified resource type was 'various' in which more than one of the listed resource types was referred to.

Summary of Part 2 findings

- *Positive and negative perceptions (including strengths and weaknesses) were mixed, with the same or similar underlying issues often perceived in both positive and negative terms. Perceptions of the legislative framework are also mixed, suggesting that stakeholders have mixed experiences of BAHA and of the regulations.*

- *Positive comments often relate to the capabilities and attitude of BAHA staff (though some negative perceptions were also coded in this respect).*

- *In the majority of cases, the identified measures were supported. Cases in which the measures are not supported are mainly related to import controls.*

- *The cost of compliance and financial issues are perceived to be causing difficulties for both BAHA and for the private sector. Other financial issues, including the availability of resources and perceptions of the cost recovery system, are also identified as negative aspects of the framework. The private sector were not generally negative about fees but did consider them to be high and a number of stakeholders held negative perceptions of the cost recovery system.*

- *Problems with stakeholder compliance and awareness were also identified and there was a strongly identified need for BAHA to increase the extent to which it interacts with stakeholders, particularly in terms of increasing levels of education and stakeholder sensitisation*

- *Resources of all types were perceived to be very limited.*

6.1.3 Other influences on the agricultural health framework

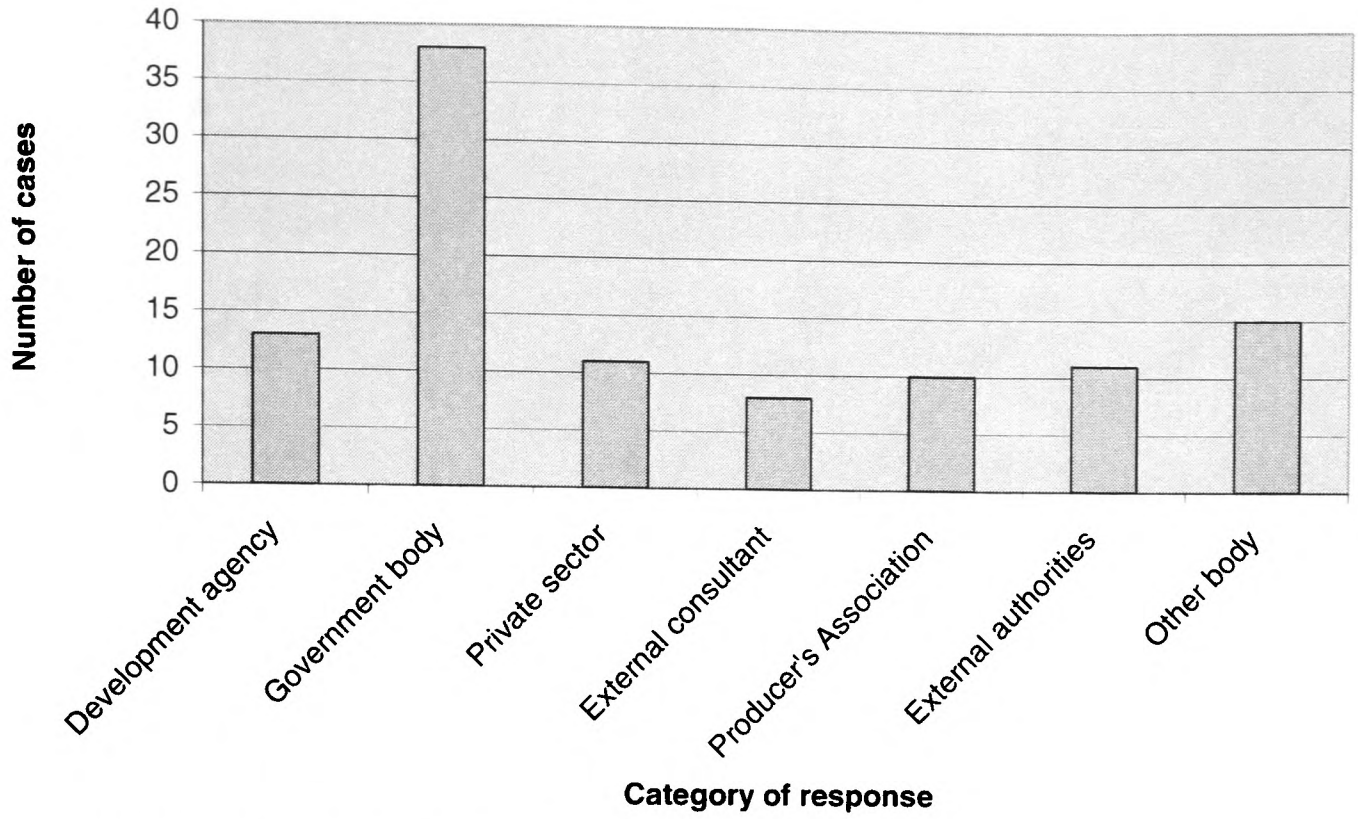


Figure 6.38: Identified third parties (totals)

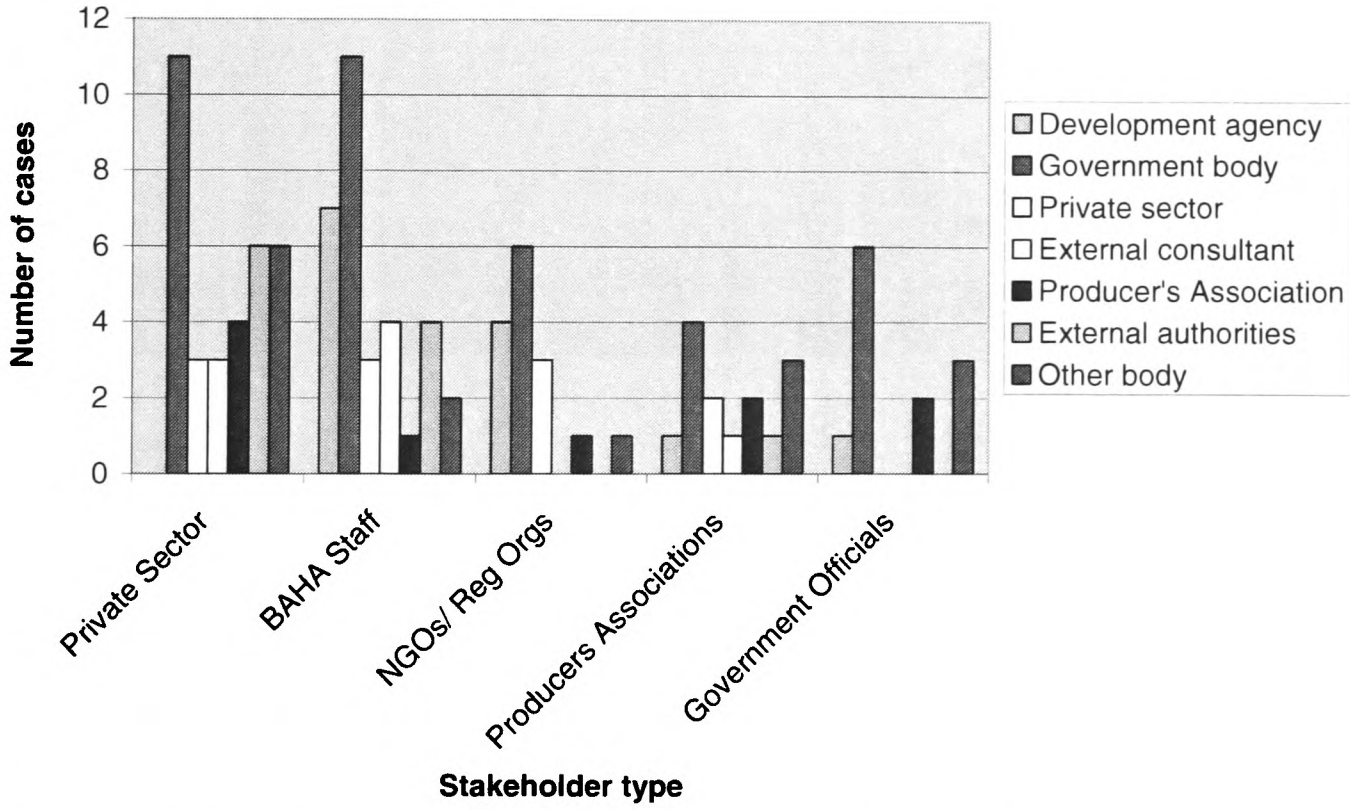


Figure 6.39: Identified third parties (by stakeholder type)

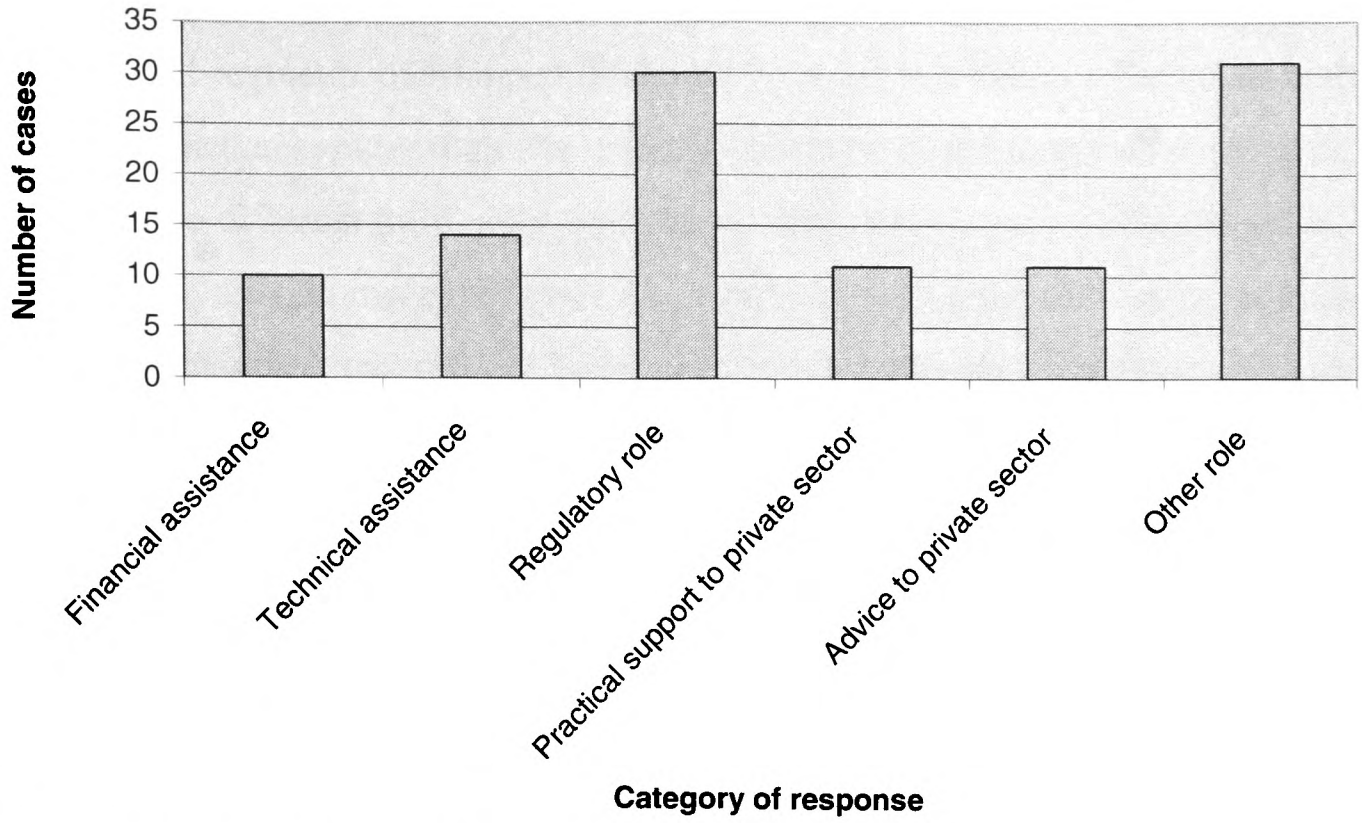


Figure 6.40: Identified third party roles (totals)

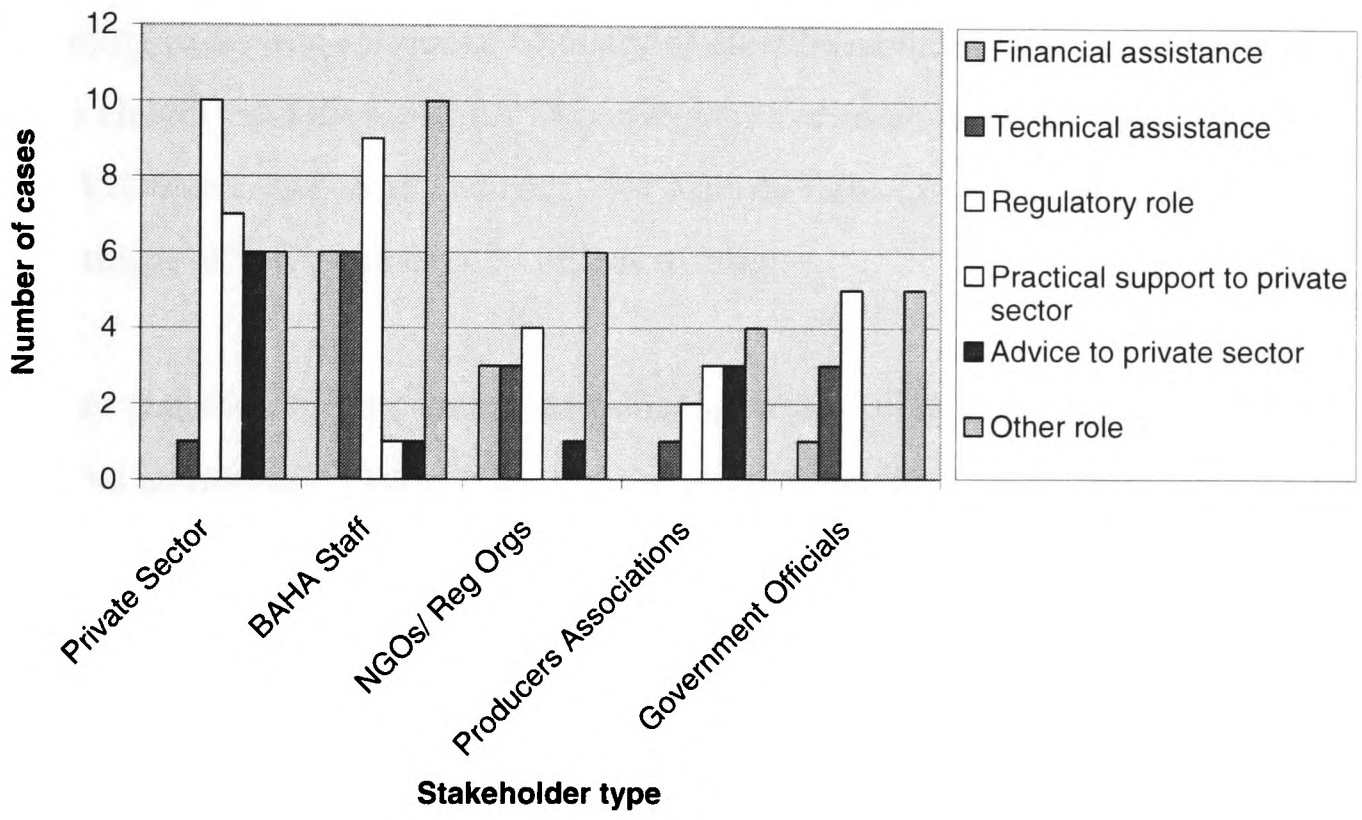


Figure 6.41: Identified third party roles (by stakeholder type)

Figures 6.38–6.39 illustrate the third parties identified as playing a role in the agricultural health framework. Figures 6.40–6.41 illustrate the perceived roles played by the identified third parties. Table 6.2 indicates the association between identified third party types and third party roles. Since these categories were coded

by **instance** rather than by **case occurrence**, the table shows the frequency with which coded segments overlapped. It should be noted that because the codes were applied by instance, more than one response could be coded to the same piece of text (e.g. two different third party types identified). Very occasionally, therefore, there may be a slight margin of error. For example, within the same piece of coded text the interviewee may refer to government bodies playing a regulatory role and producers associations playing a role with technical assistance. In this case the co-occurrence matrix would show a co-occurrence of producers associations (and governmental bodies) with a regulatory role and a technical assistance role.

'Government bodies' were the most commonly identified third party type and were referred to in a large majority of cases and by all stakeholder types (identified in 38 of the 47 interviews (81%) of interviews, Figure 6.38). Table 6.2 suggests that government bodies are most commonly associated with a regulatory role. Some of the bodies involved, particularly the Ministry of Agriculture (including extension services), Ministry of Health (including the Department of Public Health) and the Customs Department, have some regulatory overlap with BAHA. Others, such as the Ministry for Natural Resources (including the Department of Environment), have less overlap.

Another stakeholder type identified as having a predominantly regulatory role was 'external authorities' (Table 6.2). For the private sector, external authorities, particularly the United States Department of Agriculture (USDA) and United States Food and Drug Administration (US FDA), as well as the EU and Japanese authorities, were identified on a number of occasions (external authorities were identified in six cases or 38% of private sector interviews). This third party type was identified in some cases by BAHA staff (four cases) but was not commonly identified by other stakeholder types.

A number of interviewees identified third parties as playing a role in supporting the private sector (Figure 6.40). Table 6.2 suggests that there are various bodies involved in providing this support, though each is identified on only a few

occasions. The involvement of different bodies with these roles does not appear to be in one specific area but rather support is given or requested in various circumstances. For example, regional organisations (coded in this case within the grouping 'development agencies') were identified as providing educational workshops in specific areas, advice on various issues is provided by producers associations, and external consultants are brought in by private sector stakeholders to assist with the development of HACCP systems.

'Development agencies' (including regional organisations) can also be seen to play an important role within the regulatory framework.[450] 'Development agencies' most commonly referred to regional bodies, particularly the Regional International Organisation for Plant Protection and Animal Health (OIRSA) and the Inter-American Institute for Cooperation on Agriculture (IICA). Other bodies included the FAO, PAHO, the Caribbean Agricultural Research and Development Institute (CARDI) and other non-specific or unnamed bodies. In this case the role is assisting BAHA, rather than the private sector, through the provision of financial and technical support (Table 6.2). One important contribution, in terms of financial assistance particularly, is enabling BAHA to participate at the international level, for example, by attending WTO-SPS meetings. Participation at the international level was identified in several interviews as being important but difficult due to resource limitations.

'Other bodies', include those which are non-specific or in which the name of the party was not identified as well as some references to specific external training and certification bodies and to the use of 'committees' by BAHA.

---

[450] Some regional organisations such as OIRSA are not strictly development agencies but are grouped as 'development agencies' for the present purposes because of the role they have played in assisting BAHA and because stakeholders sometimes refer to them as 'partners in development'.

Table 6.2 Co-occurrence matrix showing coded segment overlap for third party type and third party roles.

	Development Agency	Government Body	Private Sector	External Consultant	Producers Association	External authorities	Other body
Financial assistance	14	0	0	0	1	1	1
Technical assistance	19	4	0	5	4	1	2
Regulatory role	2	44	0	0	2	9	3
Advice to private sector	2	6	3	2	4	1	2
Practical support to private sector	1	4	2	3	1	0	6
Other role	14	30	8	1	10	3	0

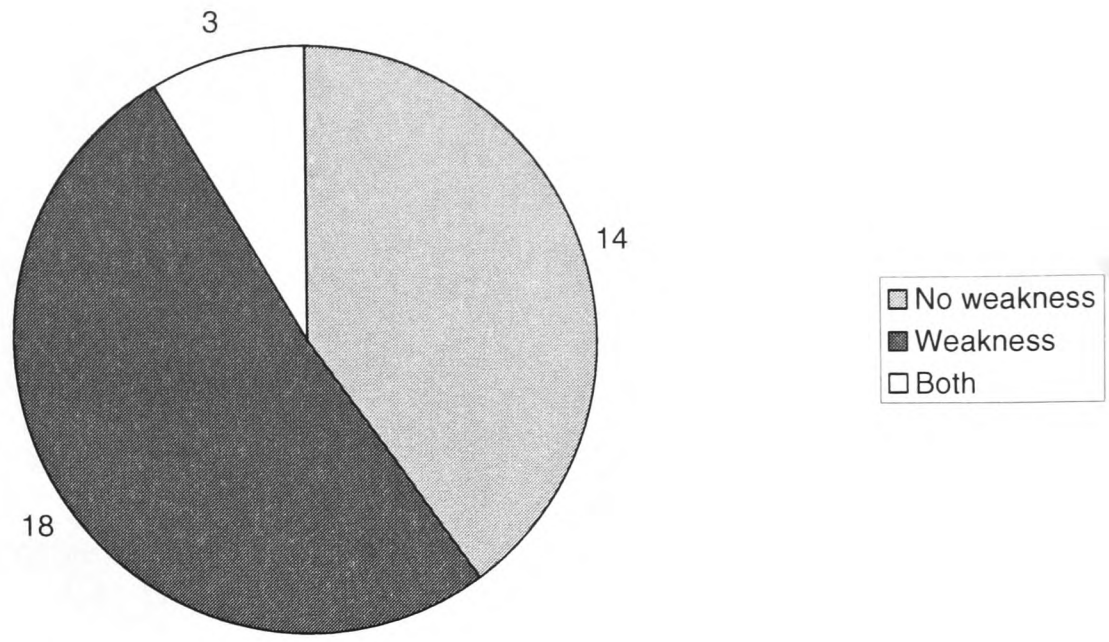


Figure 6.42: Perceptions of third party involvement (totals)

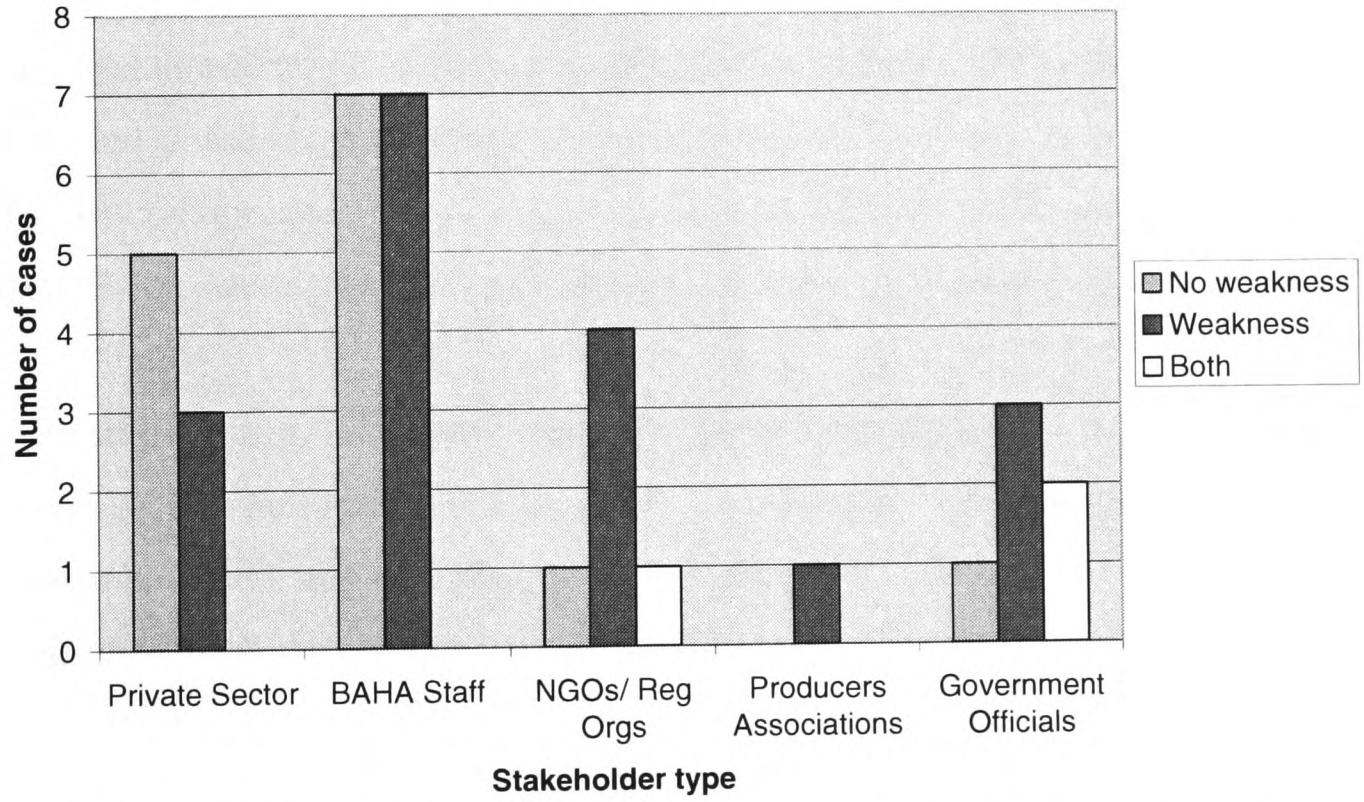


Figure 6.43: Perceptions of third party involvement (by stakeholder type)

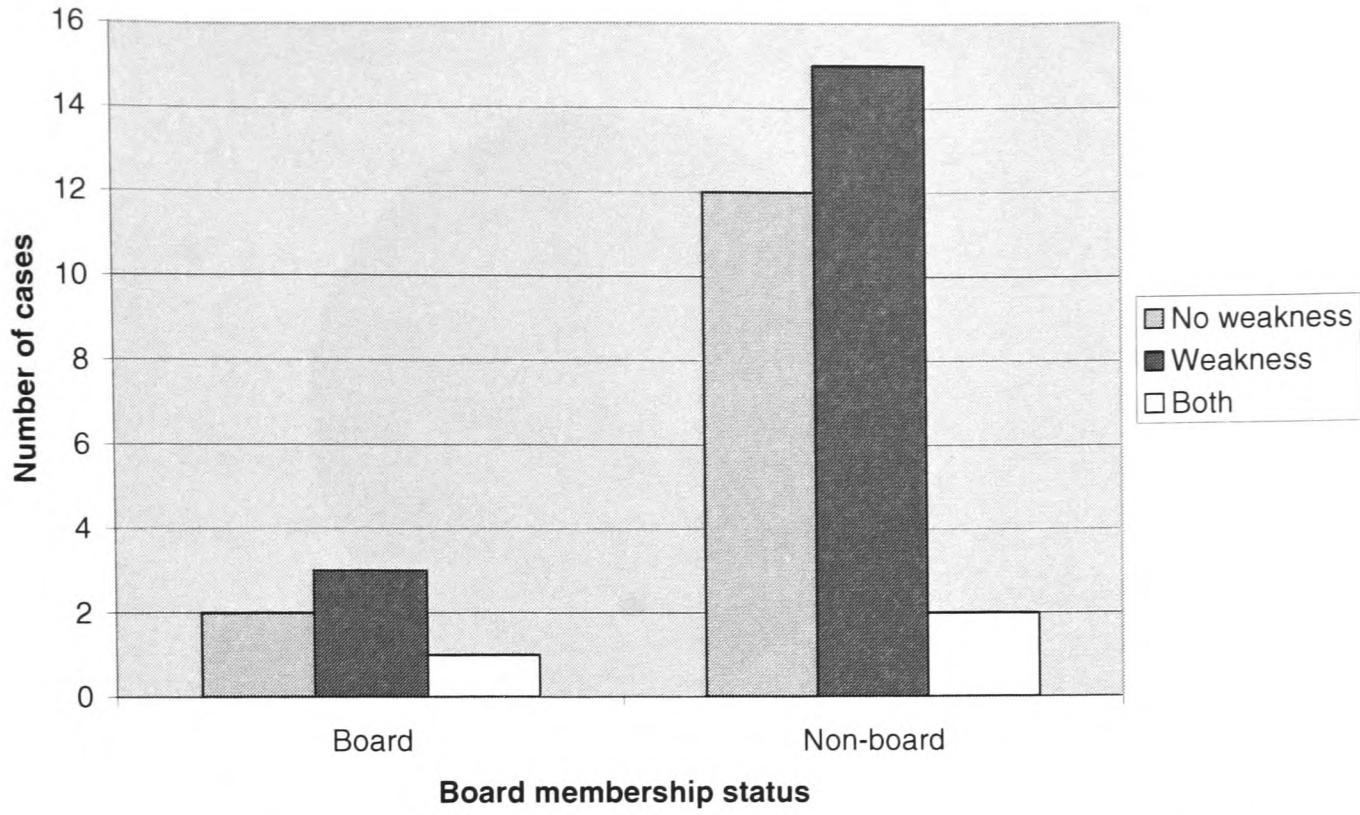


Figure 6.44: Perceptions of third party involvement (by Board membership status)

Perceptions of third party involvement are mixed. In several cases stakeholders identified a weakness with the involvement of third parties or felt that it should be improved or addressed in some way. (Figure 6.42). Two main issues were identified as weaknesses: firstly, problems related to overlapping mandates or lack of clarity or agreement on the responsibilities of different bodies, and, secondly, the decision-making powers exercised by other bodies in relation to BAHA.

External (importing) regulatory authorities were identified as third parties by six private sector interviewees (Figure 6.39). 'Weaknesses' with third party involvement were not identified by the private sector in relation to external authorities. Also, 'disadvantages' of international sources were coded in only one case and advantages in three cases, by the private sector (see Figure 6.56). These findings suggest that there are no significant problems for the private sector specifically associated with external measures and controls: problems identified in relation to the cost of implementation are likely to relate to these requirements also but perceptions of the controls themselves are not negative.

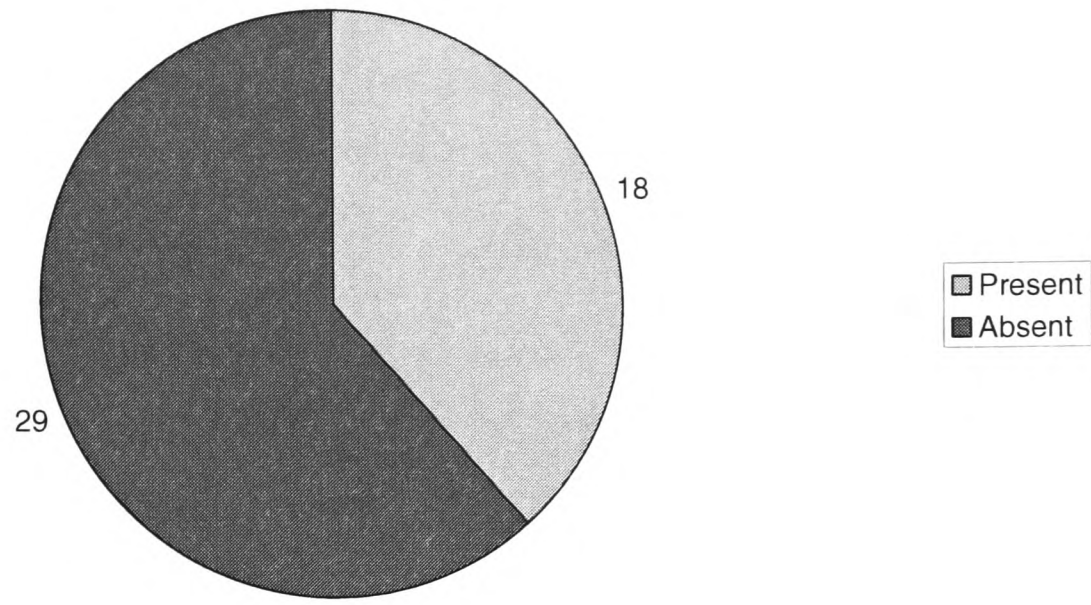


Figure 6.45: Identification of the issue of Government support (totals)

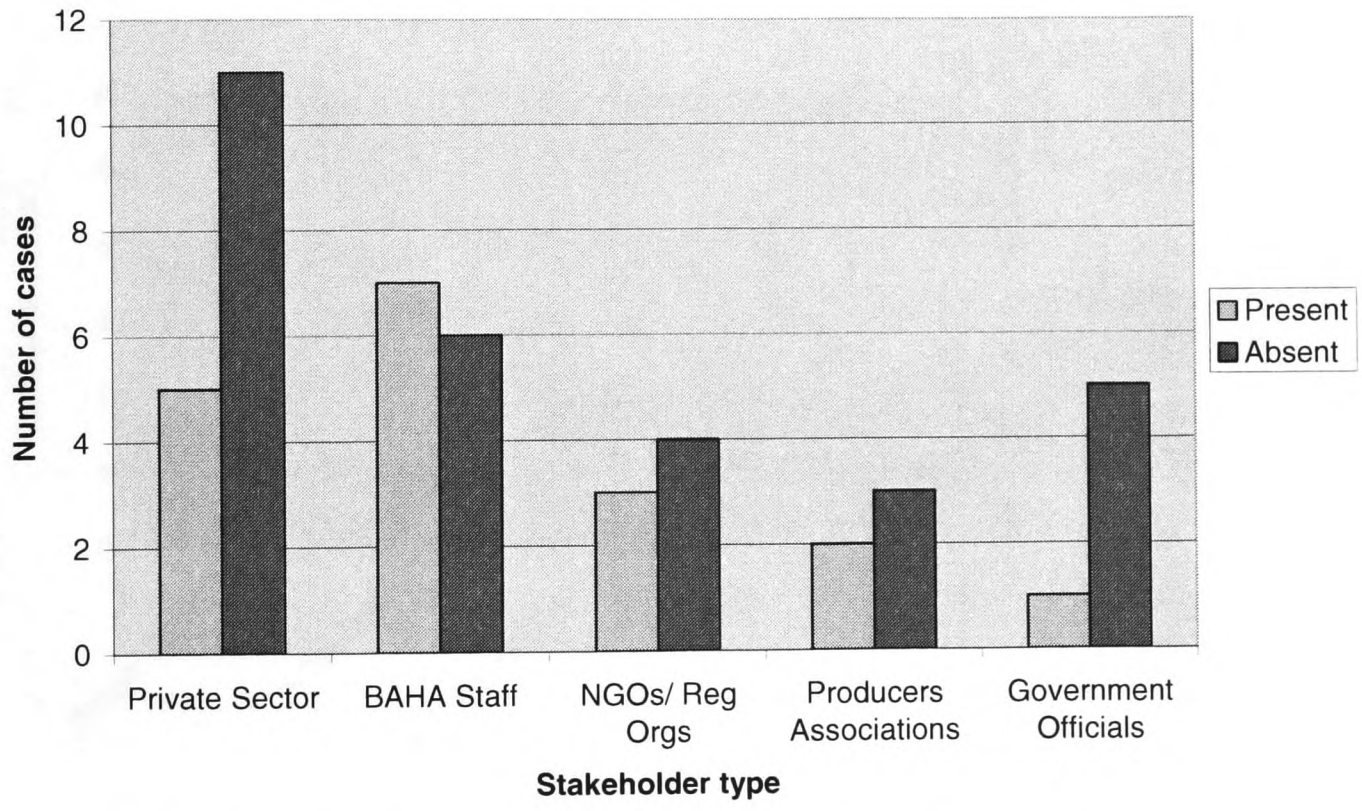


Figure 6.46: Identification of the issue of Government support (by stakeholder type)

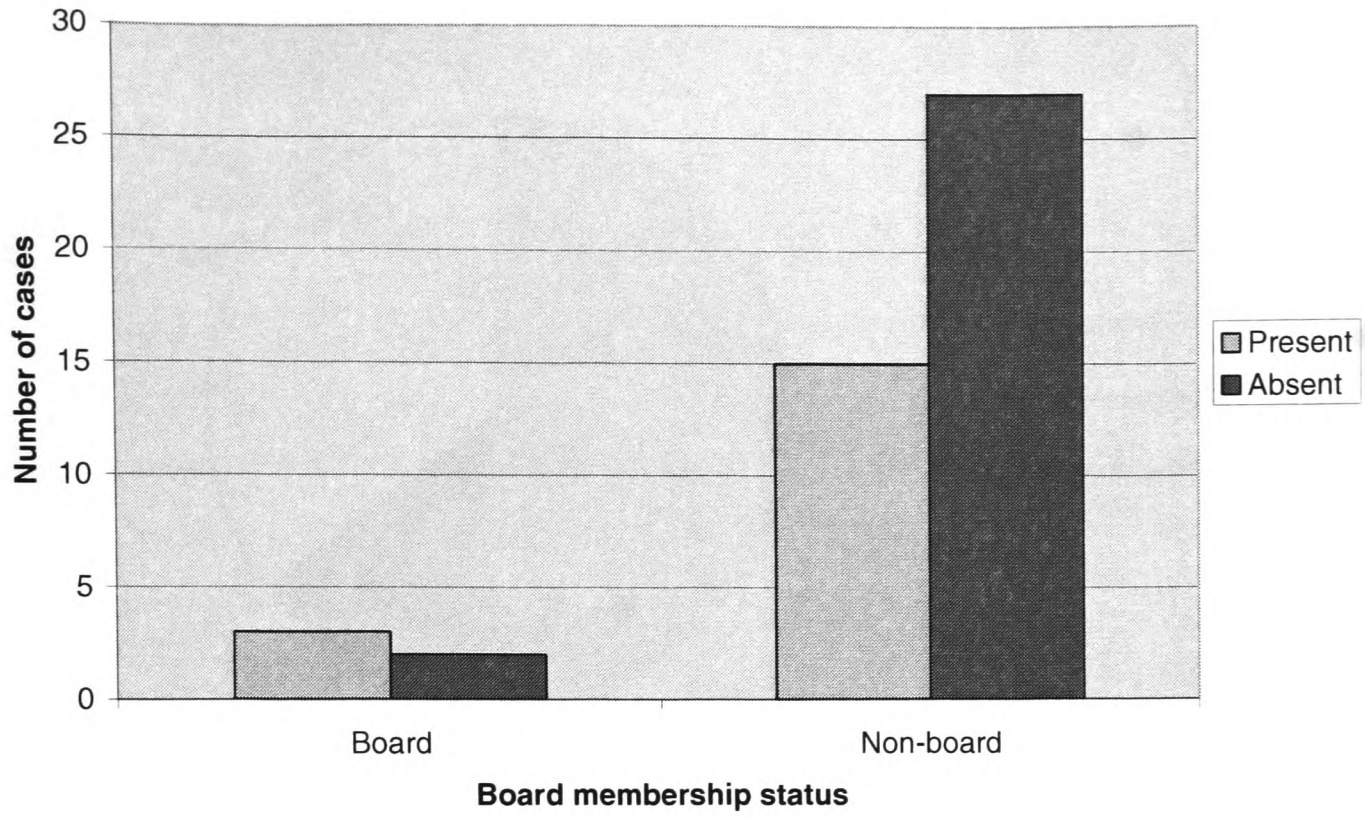


Figure 6.47: Identification of the issue of Government support (by Board membership status)

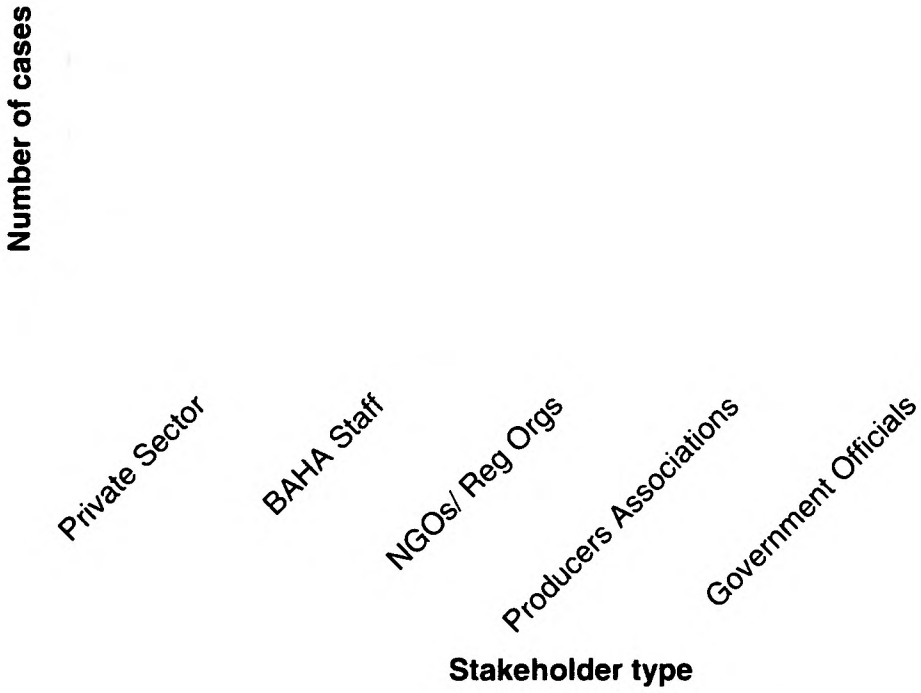


Figure 6.48: Perceptions of Government support (by stakeholder type)

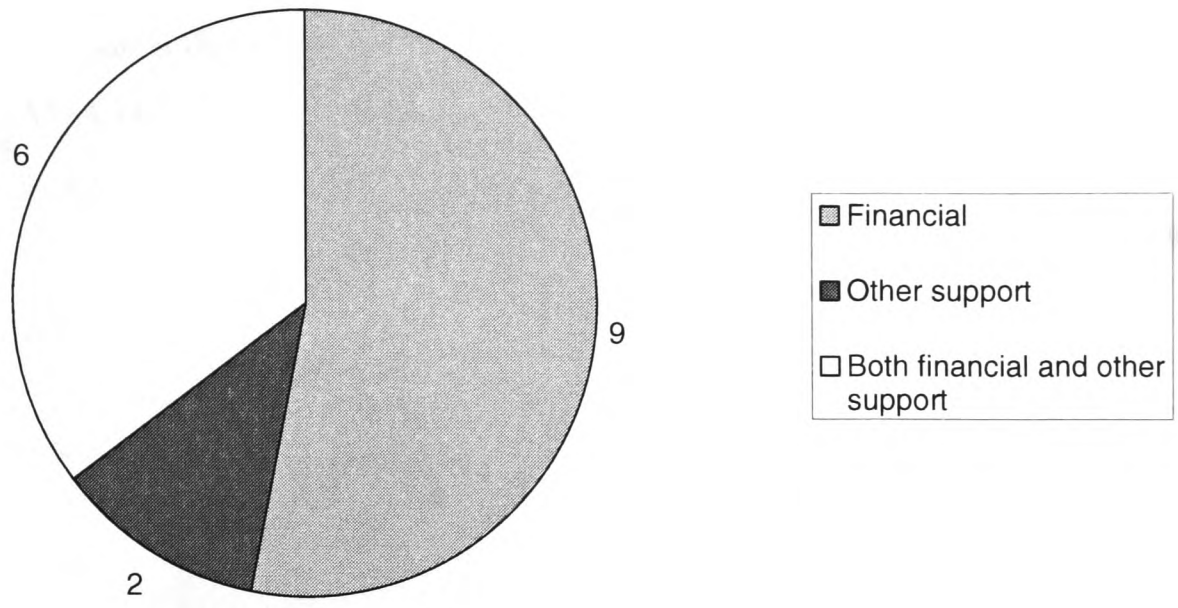


Figure 6.49: Type of Government support referred to (totals)

The level of Government support was coded as a 'weakness' of BAHA in two cases (see Figure 6.15). The need to gain Government support was coded under 'issues identified as requiring attention' in three cases (Appendix 7, Table A7.4). Figures 6.45–6.47 show, however, that although not discussed by a majority of interviewees, the issue of Government support is of more general concern. Eighteen of the forty-seven interviewees (38%) commented on the issue of Government support, with fourteen of these referring to the issue in negative terms (none referred to the level of support in positive terms, Figure 6.48). Although Government support was of most concern to BAHA staff it was commented on by all stakeholder groups and by both Board and non-Board members (Figures 6.46–6.47).

Two types of support were identified; 'financial' and 'other' (Figure 6.49). 'Other' generally referred to the level of political support given to BAHA. Concerning political support, several stakeholders felt that Government policy was at odds with BAHA's objectives, or that there was a lack of 'political will' in favour of BAHA's activities (see part two of this chapter for examples from the interviews).

A perceived lack of financial support from Government was coded in 15 cases in total. In these cases it was considered that the Government should play some role, or a greater role than it does presently, in financing the agricultural health framework/BAHA (Figure 6.49). In some of these cases it was considered that the Government should be contributing specifically to the 'public good' services.

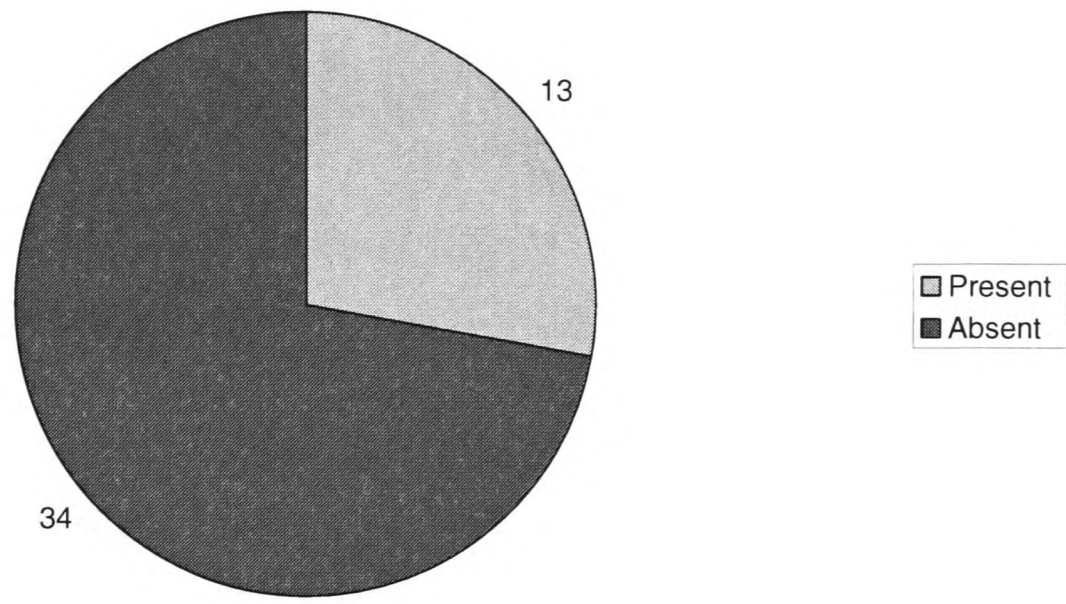


Figure 6.50: Issue of Government intervention (totals)

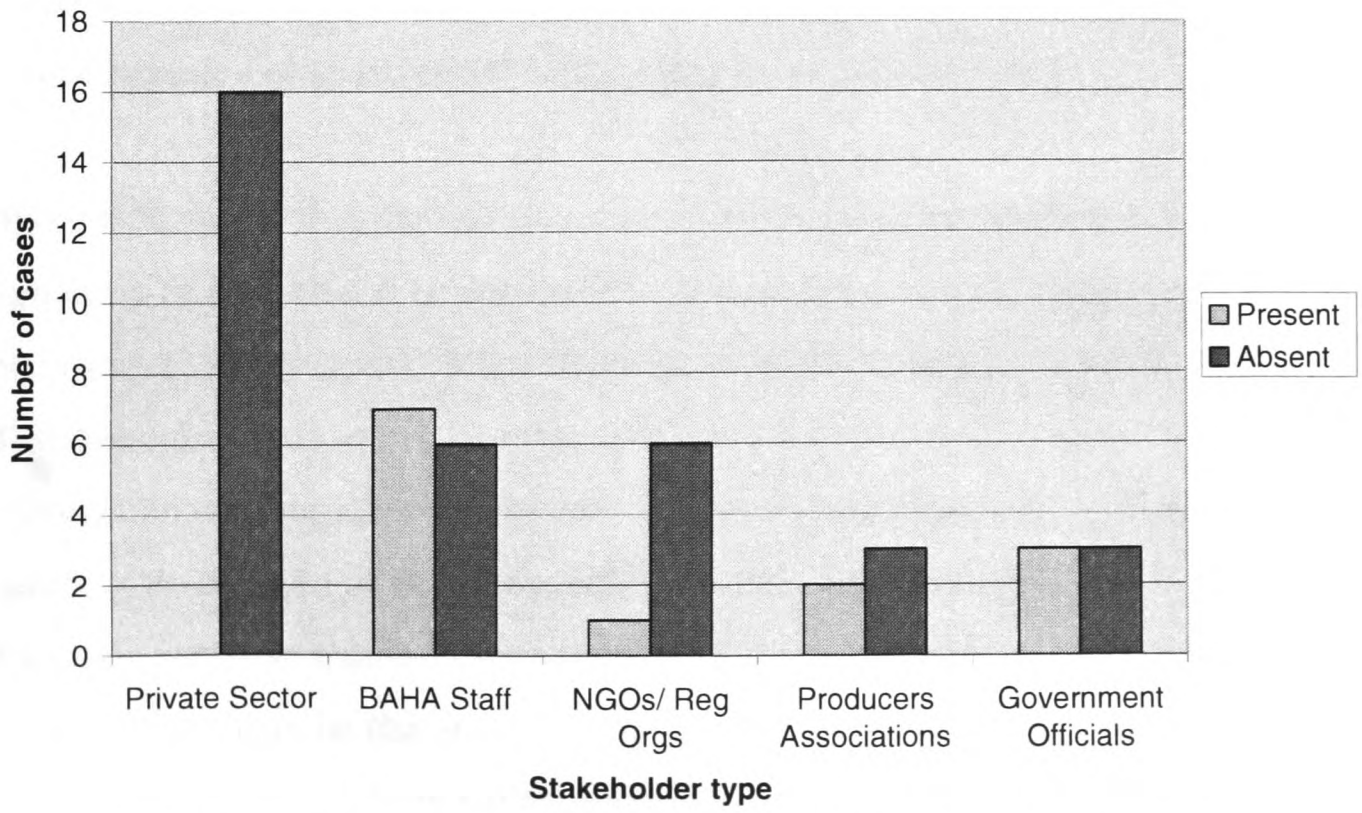


Figure 6.51: Issue of Government intervention (by stakeholder type)

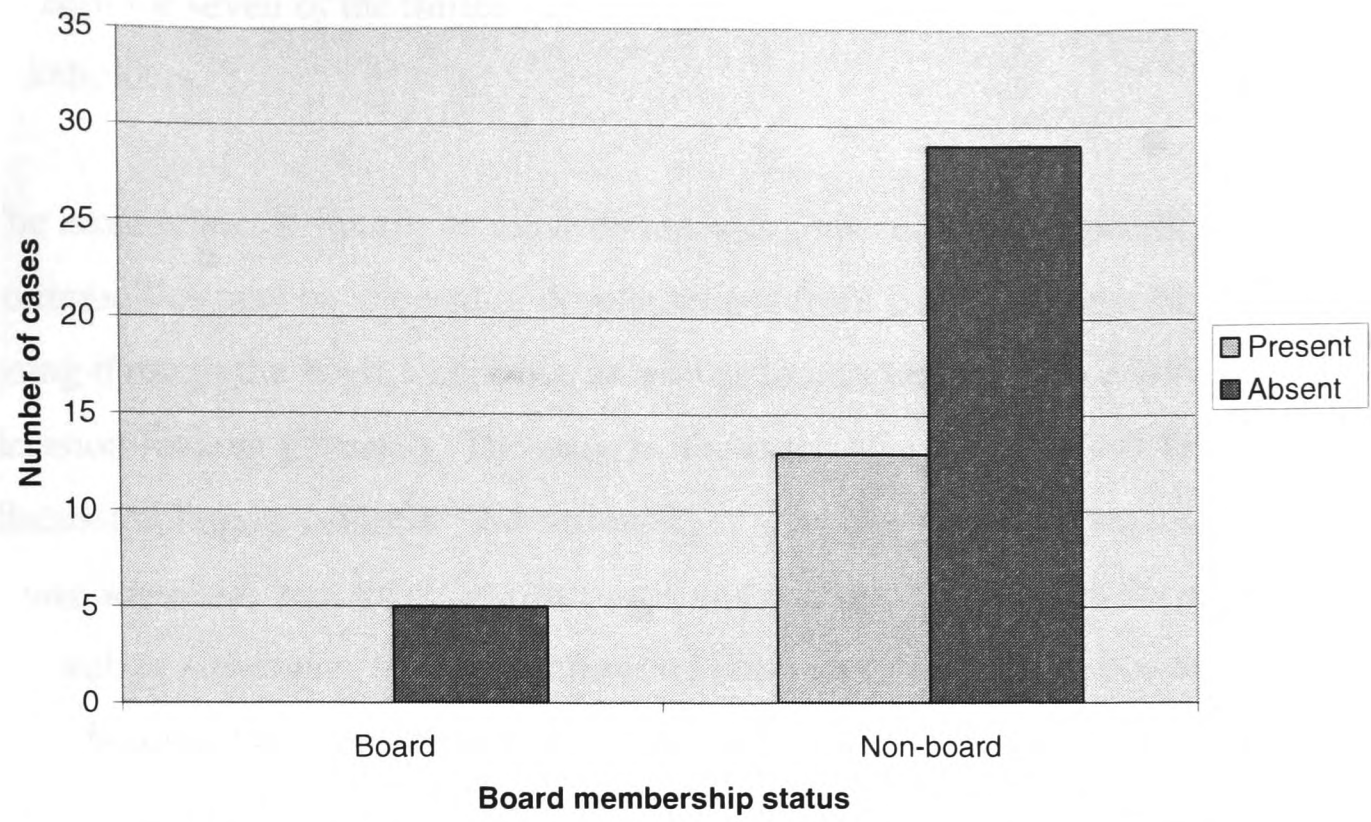


Figure 6.52: Issue of Government intervention (by Board membership status)

The 'level of Government control/interference' was coded as a negative perception in one case, (Figure 6.12), 'politics/political intervention' was coded as a weakness of BAHA in four cases (Figure 6.15), the role of the Minister was coded as a problem with the legal framework (within the category 'role and powers of BAHA') in three cases (Table A7.2) and 'powers of the MoA/Minister' was coded as a problem with the framework in three cases (Figure 6.20). In some cases in which the perception of third party involvement was coded as a 'weakness', this also referred to the involvement of the Ministry of Agriculture.

Figure 6.50 shows that the specific issue of political intervention with the regulation of agricultural health was coded in thirteen of the forty-seven interviews (28% of cases). While the issue of political support was identified by all stakeholder types, it can be seen, in Figures 6.51 and 6.52, that the issue of intervention was not identified by private sector stakeholders or by Board members. In the case of Board members this may have been because of the obviously sensitive nature of such comments. In the case of private sector stakeholders it may be that this is not something which had been encountered (and possibly then, not a widespread occurrence or concern). Nevertheless, this was a

concern for seven of the thirteen BAHA staff members, and for several other stakeholders.

The issue relates primarily to intervention with import controls, specifically that commodities may be allowed in despite refusal from BAHA, or possibly without going through the BAHA controls, as well as to intervention with day-to-day decision-making generally. The issue is illustrated by a member of BAHA staff, discussing import controls: "*For example, ( ) we are in the process of, of um fining somebody and then the Minister would call and tell us to let the person (go) through or sometimes they do not have a permit and we are supposed to charge them because they don't have the permit and the chief agricultural officers call and tell us to release the commodity*"[451]. Another stakeholder notes, "*...the way BAHA was set up it was supposed to be an autonomous body. Void of any interference. Unfortunately it has not worked out that way...and for the competent quote unquote authority to have political interference is like an oxymoron...you can have political interference and advice but not in the day to day activities and how to do your work...or when to do it, or who to do it with*". Commenting on enforcement they also note, "*It's um, even though we have the legal framework to like, for example, stop a process or detain a shipment we have to inform the, the director and because usually it's at that level, that the political powers would come in anyway*"[452]. A government official outside of BAHA makes a similar observation: "*Weaknesses...uh I would say political interventions...sometimes the, the, the – when it comes to quarantine the need to take up, they need to do their job and um, sometimes uh there are interventions*"[453].

---

[451] BAHA interview 20
[452] BAHA interview 6
[453] BAHA interview 46

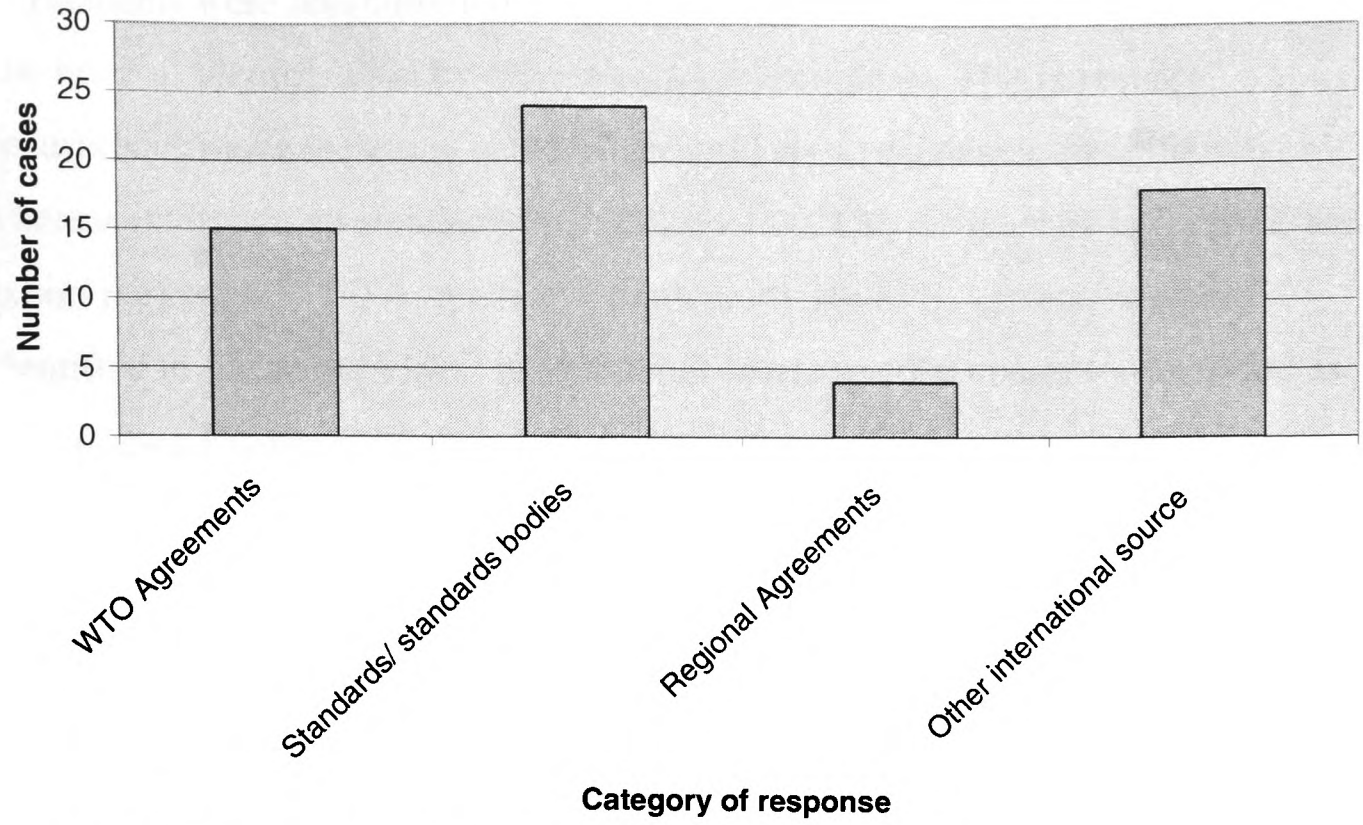


Figure 6.53: International sources of law/controls (totals)

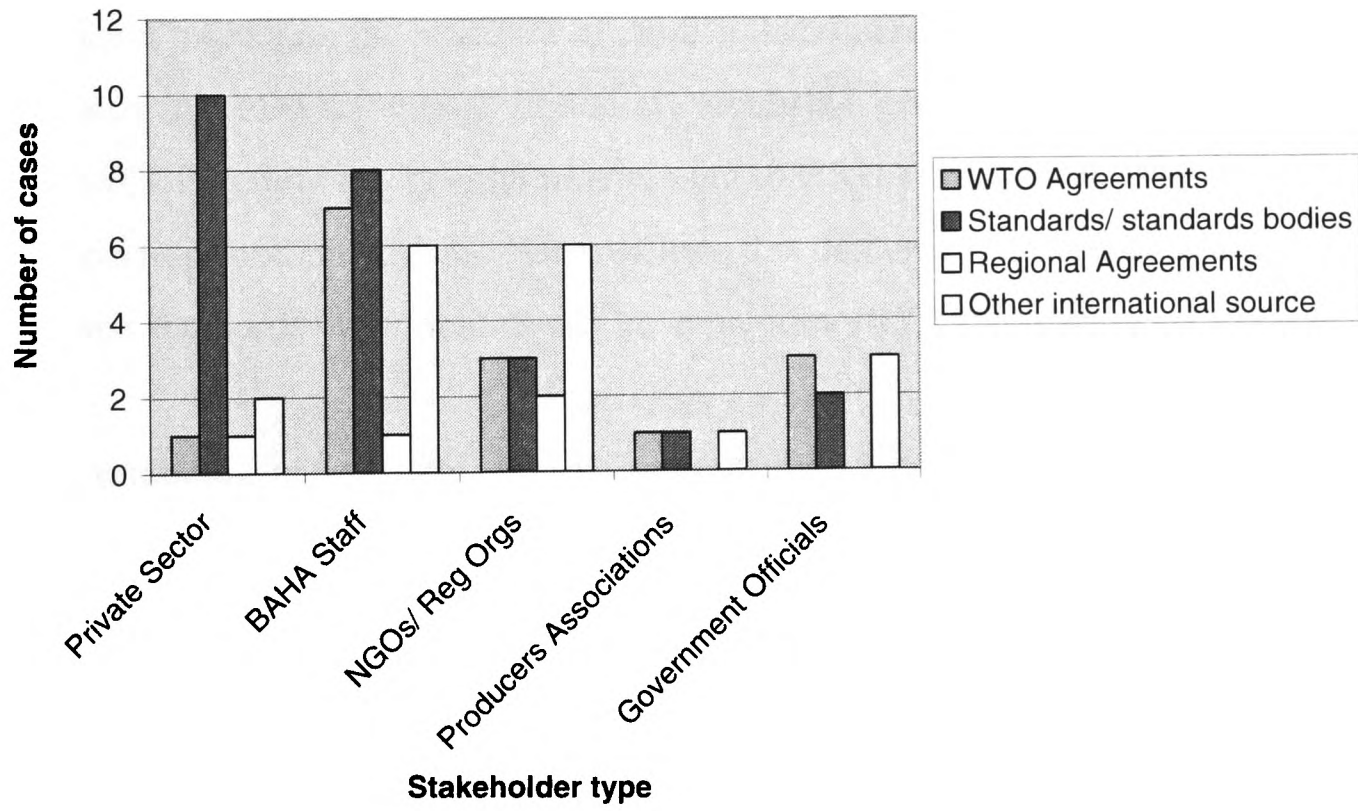


Figure 6.54: International sources of law/controls (by stakeholder type)

The most commonly cited international source was international standards including standard-making bodies such as the OIE, IPPC and Codex (referred to in 51% of cases, Figure 6.53). It can be seen that these standards were particularly significant to the private sector and to BAHA staff (Figure 6.54). WTO

Agreements were less commonly identified, though this was primarily due to a low level of identification by private sector stakeholders. This is perhaps unsurprising since these stakeholders are unlikely to encounter these directly, whereas international standards, particularly HACCP, are referred to for trade and export purposes. WTO Agreements, particularly the SPS Agreement, were identified in 15 cases (32%). International environmental sources were coded as 'other', (see Figures 6.53 and 6.58).

It has been seen that international standards and standard bodies are the most commonly identified source of international law for both the private sector and BAHA staff (Figure 6.54). For the private sector, 'HACCP' (referring to the implementation of a HACCP system), was the most important standard with the majority of private sector stakeholders making reference to this. The frequency with which private sector interviewees identified HACCP as a source of control/regulation indicates that this is one international standard that has had a significant impact on the practices of these stakeholders. It is not necessarily surprising that HACCP was so frequently identified, given that the implementation of a HACCP system is a general requirement of BAHA's food safety regulations for exporting food processors. Nevertheless, this demonstrates the strong influence that such standards or guidelines can have on domestic regulation.

The prominence of 'external' sources of control and regulation is, perhaps, unsurprising given that most of the private sector stakeholders interviewed were involved with export in some capacity and market access is therefore likely to be a key influence on their practices. The findings are nevertheless important as they indicate that importer requirements and other external sources of control may be as important as domestic controls in regulating private sector practices. Private sector references to HACCP often did not explicitly associate this as a domestic, BAHA control, though in some cases this may be implicit, as illustrated in the following examples:

> "*Well BAHA has their legislation and their um and, and we're um working with them and we're implementing the GMPs and the, the uh HACCP plan that uh that we have been um, working on and we've been, we're setting up*

HACCP in our plant and we've got um, external training and external uh setting up the plant for us"[454]

"*Interviewer: ...are there any laws or um, legislation in place that you think affects you in relation to agricultural health?*
Interviewee: of course um, we are, right now working under HACCP"[455].

HACCP was, however, often associated with market access, including, on some occasions, as a requirement of importing countries.

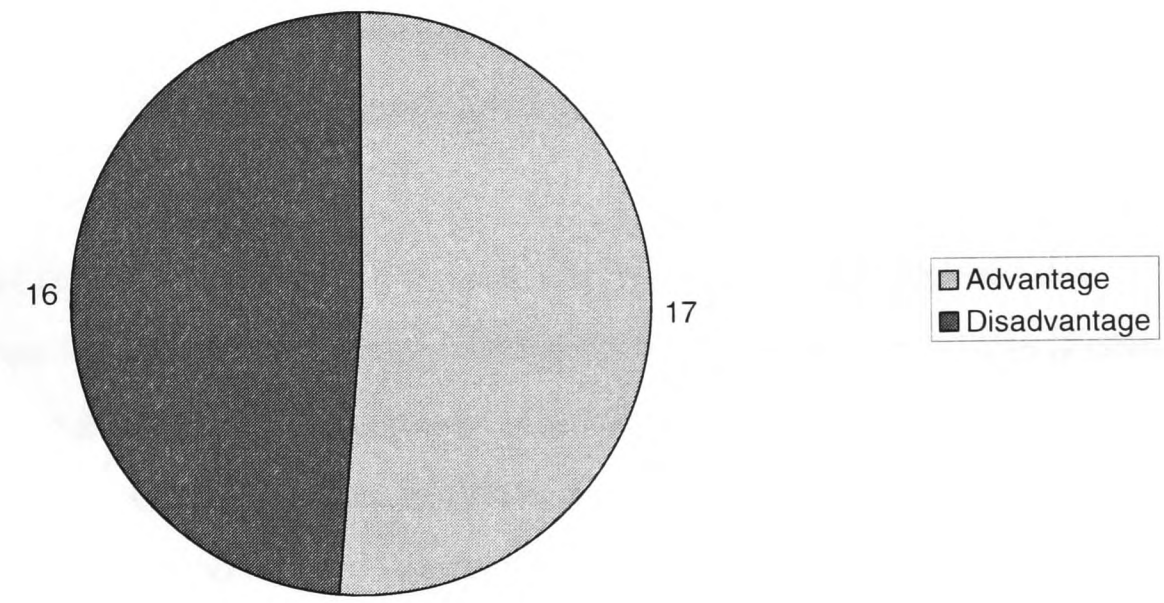


Figure 6.55: Perceptions of international sources of law/controls (totals)

[454] BAHA interview 29
[455] BAHA interview 43

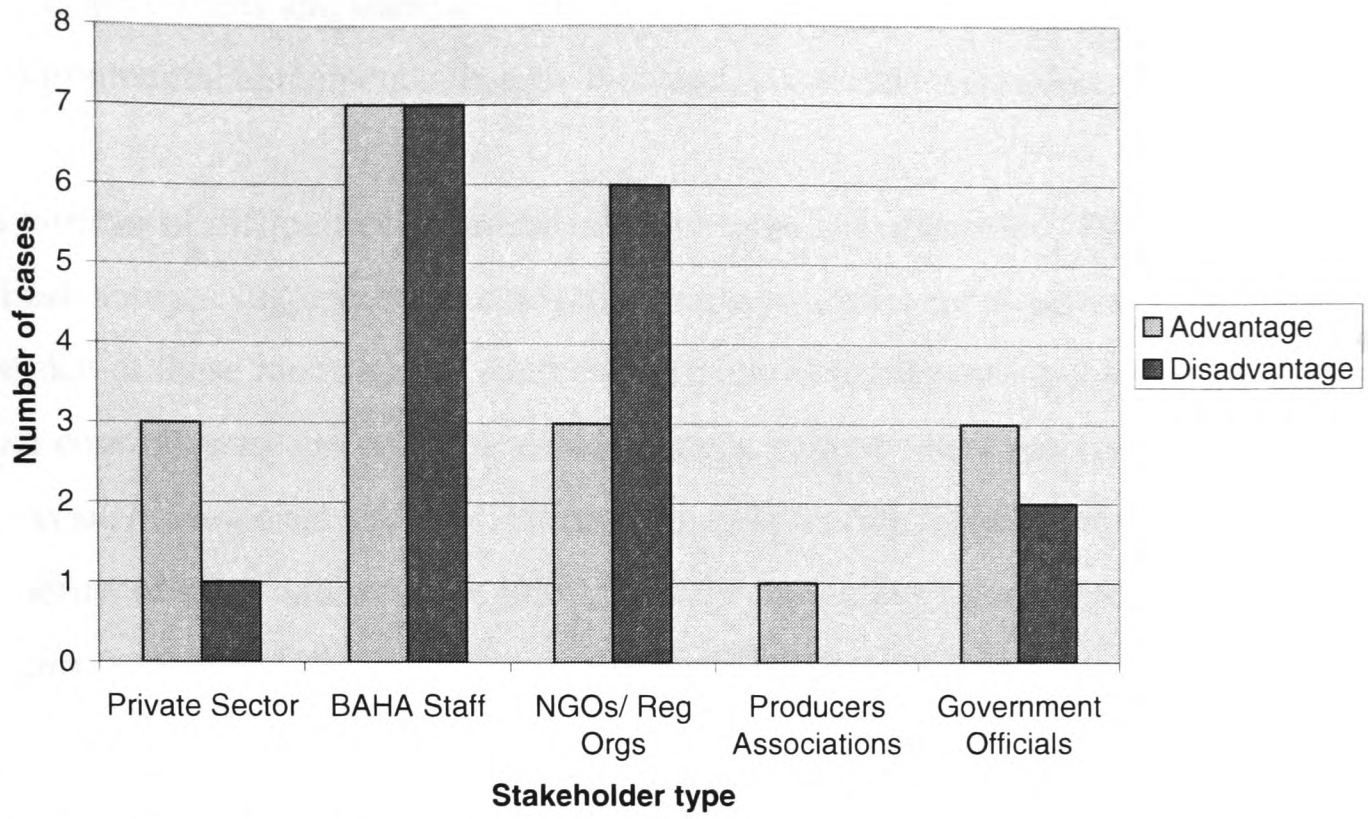


Figure 6.56: Perceptions of international sources of law/controls (by stakeholder type)

Perceptions of international sources were mixed, with advantages identified in seventeen cases (36%) and disadvantages identified in sixteen cases (34%) (Figure 6.55). As seen in Figure 6.56, perceptions of international sources varied across the stakeholder groups: government officials, producers associations and the private sector identified advantages more often than disadvantages, NGOs considered the sources to be primarily disadvantageous, and evenly mixed views were identified among BAHA staff. A number of the identified advantages (and disadvantages) were not necessarily made with reference to specific agreements or controls, but often referred generally to whichever sources had been identified. While the most common of these advantages was the direct impact on increased market access, a number of other responses indicated that these sources are considered to benefit market access indirectly and to contribute positively to the regulation of agricultural health in Belize.

Though most specific advantages were identified in no more than one or two cases, the findings do suggest that some positive impacts on agricultural production and regulation have arisen as a result of the influence of international

trade agreements and standards (perceived advantages did not refer specifically to environmental agreements, though, as noted, comments were often general).

A number of difficulties and disadvantages were also identified. These disadvantages suggested some negative impacts arising from the implementation burden of these international sources. Difficulties implementing international laws and controls were not coded as disadvantages, except where specifically referred to as such. However, the implications of implementing these international controls in terms of costs and resource impacts on the regulatory agency and the private sector, was one of the most frequently identified disadvantages.

Another important issue is the extent to which BAHA (and Belize) is able to participate effectively at the international level and can derive the benefits of these international agreements. This was also seen by some as a disadvantage. The competitiveness of Belize and the ability to compete with other countries, as a result of involvement with these agreements and of trade liberalisation generally, was identified in six cases. In this respect it was felt that Belize, particularly because of its relatively small population and scale of production, was unable to compete favourably with other countries. Another perceived disadvantage was that 'bigger' or 'richer' countries were the ones who actually set the agenda and developed standards, at the international level, and that these bigger countries were the ones that derived the benefits of involvement with international agreements, with Belize being limited in the extent of its involvement. Similarly, the lack of prior knowledge of, and participation in, these agreements was identified as a disadvantage in some cases. The perception that a country like Belize was unable actually to enforce its rights under international organisations and agreements, due to the costs involved, was expressed in one further case. It has been seen that development agencies play a role in assisting BAHA with participation at the international level. There were, however, some observations that effective participation may still be limited.

Other disadvantages, generally identified in one case each, included the perception that international standards were overly complicated and burdensome, that the transparency in declaring pests could be detrimental (in terms of resulting trade restrictions) and that involvement with international trade would lead to the introduction of alien species.

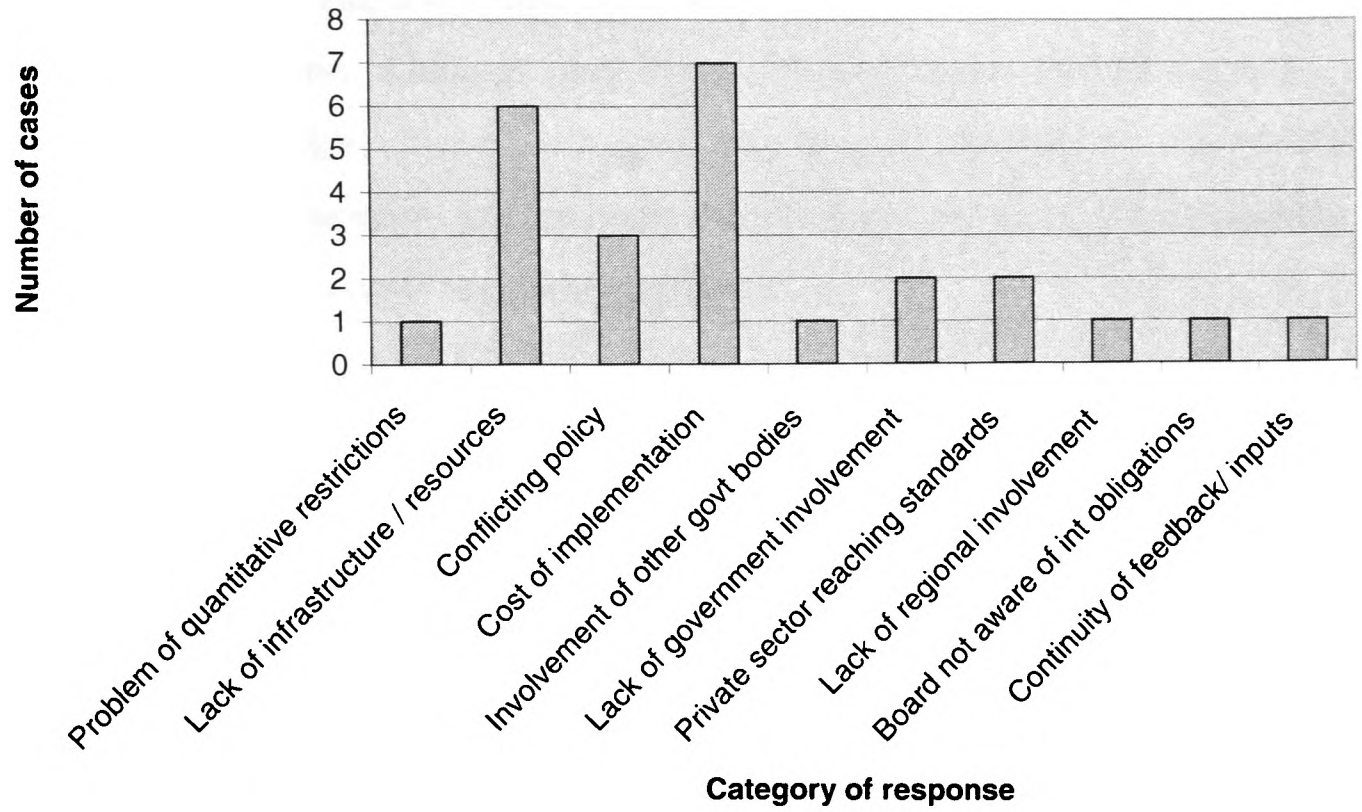


Figure 6.57: International sources of law: national compliance difficulties

Figure 6.57 shows difficulties specifically related to compliance with, and implementation of, these international sources and measures, identified through grounded theory coding. Note that in a very few cases there may be some overlap with negative perceptions, as seen above.

The cost of implementation was the most frequently identified obstacle and this was perceived as a difficulty affecting both BAHA and the regulated community. ISPM 15, for example, is noted by one stakeholder to entail increased costs to a range of parties with the result that implementation is being delayed.[456]

[456] ISPM No. 15: guidelines for regulating wood packaging material in international trade, 2002. This is an international standard issued by the IPPC. ISPM 15 describes phytosanitary measures which can be used to reduce the risks of pest introduction associated with wood packaging material. Approved measures, set out in Annex I, are heat treatment or fumigation with methyl bromide.

Stakeholders also commented on the lack of resources and infrastructure being difficulties in the context of implementation. Three stakeholders identified conflicting policy as a problem for implementation and a further comment, coded as 'lack of Government involvement' suggested that in the case of GMOs and the Cartagena Protocol the problem was an absence of policy. A similar issue arose in respect of the Board of Directors. In this case it was felt that the Board was not aware of BAHA's obligations under international agreements, and were focused only on cost-recovery. Although most of the difficulties were identified only by one or two stakeholders, these perceptions may indicate that the potential benefits of international agreements are not being fully derived and that these agreements increase the burden on the regulatory agency.

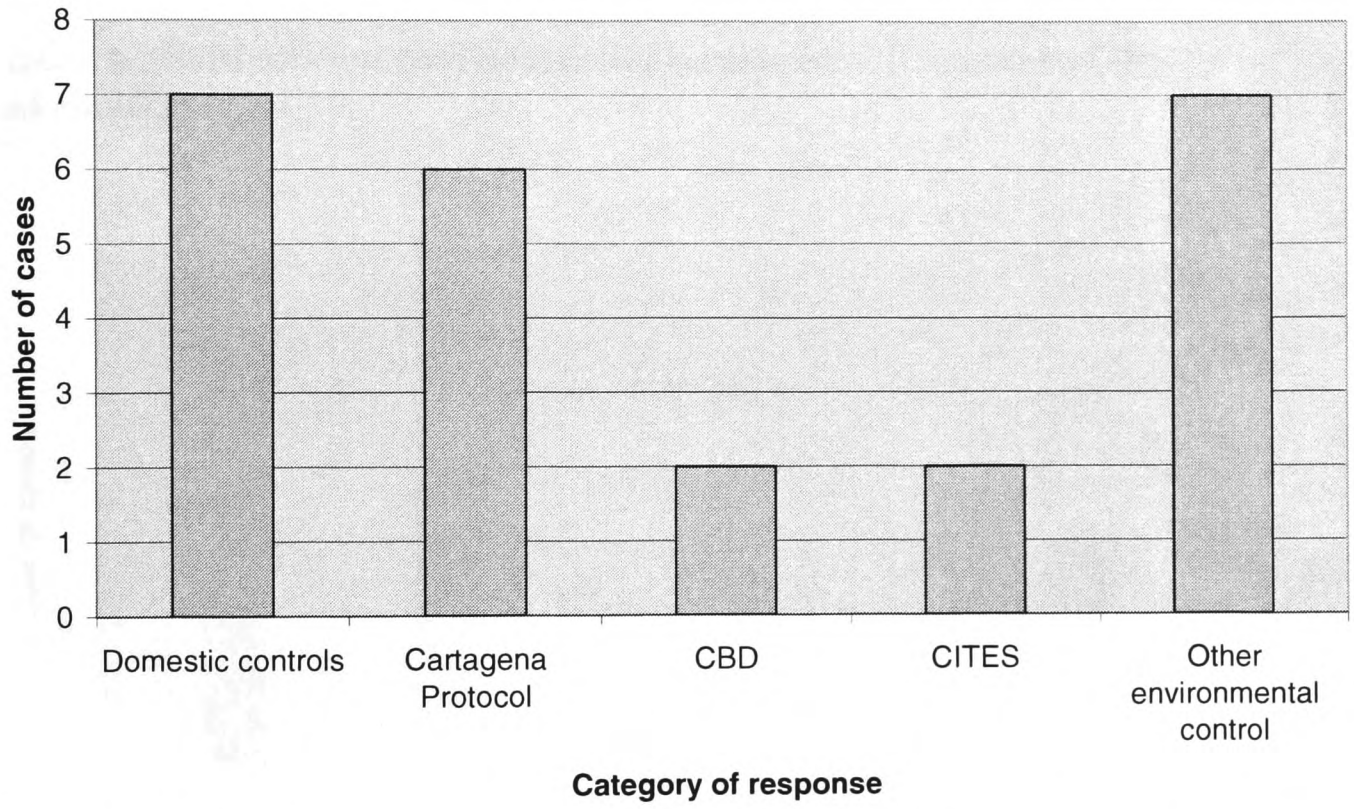


Figure 6.58: Identified environmental measures and sources of control (totals)

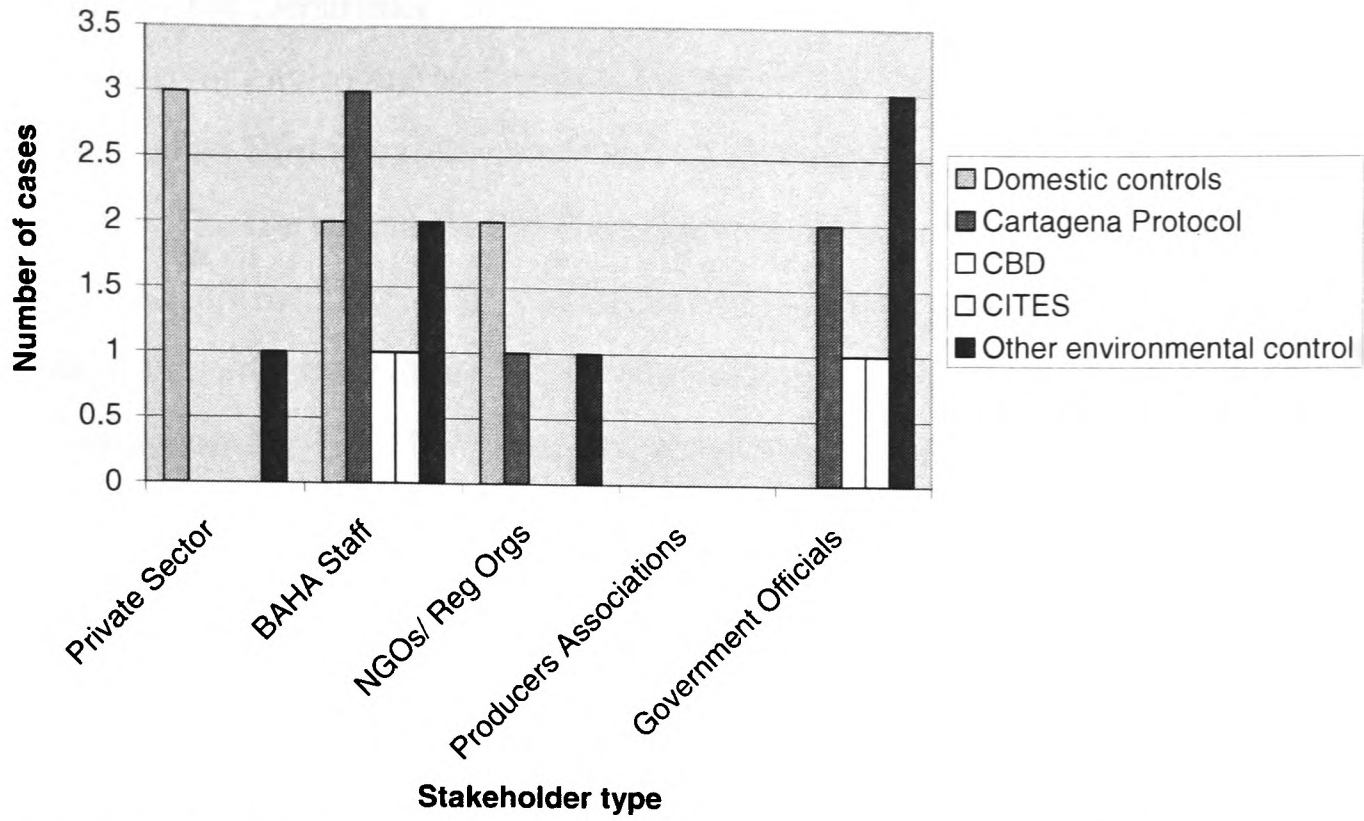


Figure 6.59: Identified environmental measures and sources of (by stakeholder type)

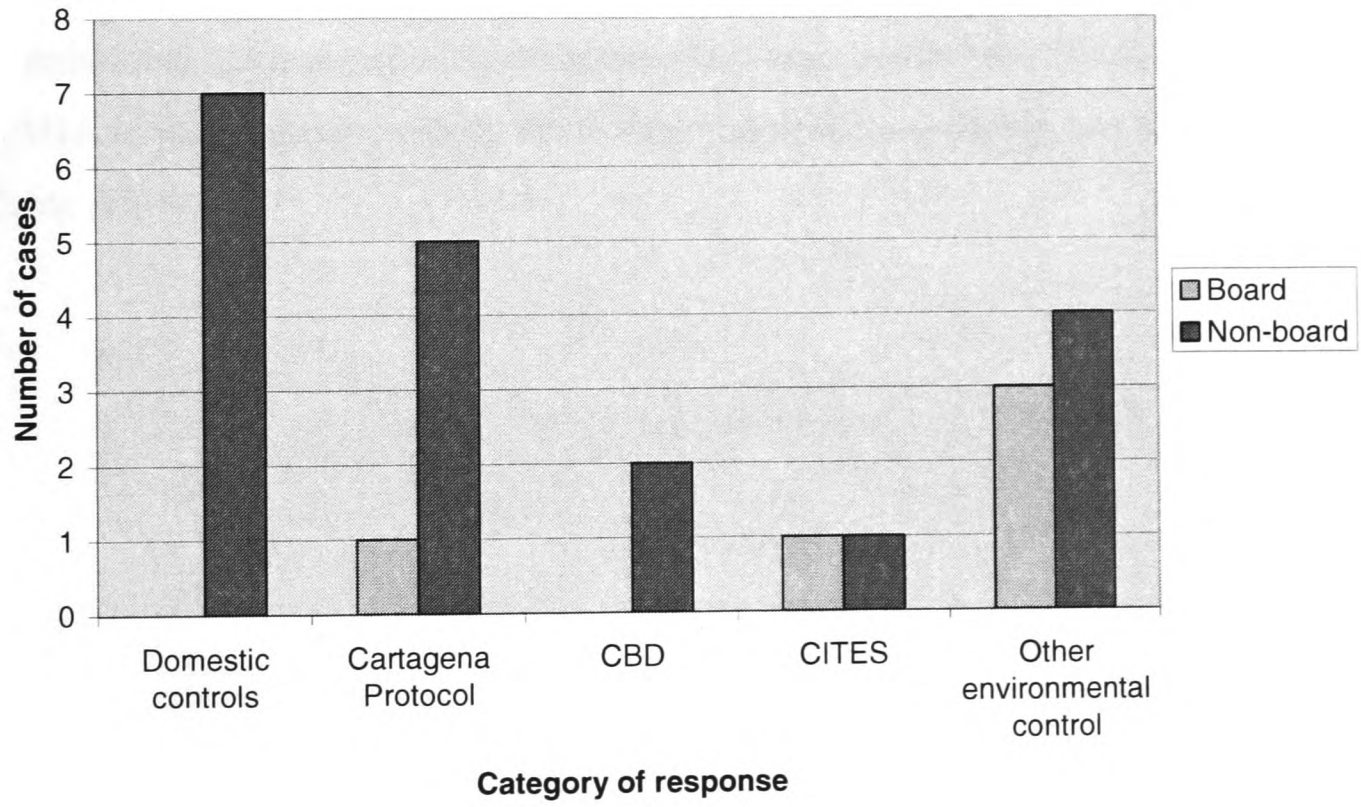


Figure 6.60: Identified environmental measures and sources of (by Board membership status)

The identification of international environmental controls was much less frequent than identification of trade agreements and other international sources (Figures 6.53 and 6.58). Domestic measures, such as the monitoring of waste waters,

required by the Department of Environment, were more common, and were the main source of environmental control for the private sector (Figure 6.59). The Convention on Biological Diversity and CITES were each identified on only two occasions. The Cartagena Protocol was identified in six cases, three of which were by BAHA staff members. The low frequencies with which most of these controls are identified suggest that there has been little, if any, direct impact of these agreements on BAHA. That is not to say that the regulatory framework operates independently of environmental regulation—as has been seen above the Ministry for Natural Resources has been identified in some cases as playing a role within the framework (though in several of these cases this was a regulatory role, based on the enforcement of environmental measures on the private sector).

No particular problems were identified in relation to the influence, or lack thereof, of the environmental agreements, nor was there any perceived need for a greater involvement of the Ministry of Natural Resources or greater involvement with the international environmental agreements. (One stakeholder identified a need for BAHA to play a greater role in environmental decision-making, see Appendix 7, Table A7.4).

Summary of Part 3 findings:

- *A variety of third parties are identified as playing a role within the agricultural health framework. A number of bodies have a regulatory role within the agricultural health framework, including the authorities of importing countries. Other third parties provide assistance both to BAHA and to the private sector.*

- *Difficulties with the involvement of third parties most commonly relate to overlapping mandates and responsibilities and to the exercise of decision-making powers, by other bodies, for agricultural health.*

- *A lack of financial support (particularly with respect to 'public good' services) and of political support from Central Government was an issue for several stakeholders.*

- *The issue of Government intervention, particularly in terms of decision-making related to import controls, was also a concern for some stakeholders.*

- *International standard making bodies and their associated standards were the most commonly identified source of international control and were particularly important to the private sector.*

- *Perceptions of international sources of control were mixed. Advantages most frequently related to the direct or indirect benefits to market access. Disadvantages and compliance difficulties suggest that some of these advantages may be mitigated due to the increased burden on both BAHA and on the private sector. The extent to which Belize can participate internationally and derive the same benefits as other (bigger or richer) states was also a concern for a few stakeholders.*

- *Identification of international environmental agreements was very low and indicated that these agreements have little direct impact on the agricultural health framework but at present are not causing difficulties.*

6.2 FURTHER ANALYSIS AND DISCUSSION

6.2.1 Perceptions and impacts of the cost recovery system

The present framework for agricultural health is designed to operate primarily on a cost-recovery basis, with fees being charged for agricultural health services provided by BAHA. The benefits of such a system, recognised in the implementing project, are that dependency on public funds is minimised or removed, as are the associated bureaucratic problems with accessing such funds. Thus the financial sustainability of the regulatory agency should be increased. It was expected that this system would enable an improvement in the quality of services offered. The cost-recovery system was one of the issues most frequently commented on by stakeholders. The findings indicate that there has been some success in operating on this cost-recovery basis. Generally, the private sector was not averse to paying fees and understood the need for BAHA to charge for services. Though the fees are perceived to be high, these and other stakeholders support some degree of contribution from the private sector (Figure 6.26). One member of BAHA staff specifically identified the system as a strength of the framework (Figure 6.14).

Overall, however, the findings indicate that in practice the system places some restraints on the effective regulation of agricultural health. It can be seen that there are two main issues: the first is the perceived detrimental impact of the cost recovery system on the private sector. The second is the extent to which BAHA is limited in regulating effectively agricultural health, through the provision of user-services and other programs and activities (see Figures 6.26–6.28).

Concerning the impact on the private sector, negative comments on fees and on the cost recovery system indicated that fees are perceived to be too high and consequently limit the extent to which the private sector can use services, and/or that the fees have a negative impact on private sector industries generally. This is reflected in a comment from a private sector interviewee—"*Uh, it seems to me*

like, like they don't really care about the industries...first of all their charges are, are way too high"[457]. Interviewee 24 also comments:

> "*Those that would happily comply or asking me to come by would be the, the, the bigger or the that have, has more cattle or more heads of animals...but then the poor farmer has like a dozen head of cattle and let's say he lives like, thirty miles away, our charge is a dollar and fifty Belize per mile both ways, that would be sixty by hundred and fifty cents and he would have to think twice about having me come out there and dealing with it no?*"[458]

Cases identifying a negative impact of the framework on the private sector (Figures 6.22–6.24) also sometimes identified this in the context of the impact of costs on these stakeholders. Thus, while there is theoretical support for financial input from the private sector, in practice the system may prevent those stakeholders from accessing and using services.

The impact of the cost recovery system on the private sector has a number of implications for the regulation of agricultural health. Clearly, in situations in which costs are a barrier to the use of regulatory services, the effectiveness of the regulatory measures and controls may be reduced. In terms of pest and disease control, for example, the risk of outbreaks occurring and not being controlled are increased where a producer, because of the costs involved, does not call out BAHA in response to a suspected outbreak. There may also be impacts on the overall development of the agricultural sector in cases in which not all stakeholders are able to access services. Interviewee 24 (above) indicated that costs posed greater difficulties for smaller-scale farmers. A member of BAHA Staff also comments that:

> "*Because like I said even though we have services that we charge for, that in food safety, food safety is a public good...and then you can't go into the little villages and somebody wants help with their little, the jars of, some jam or jellies that, no because you can't afford to pay the fees if you're not... and I think that is how it's getting...is that in my opinion BAHA is only serving those that can afford it*"[459].

---

[457] BAHA interview 43
[458] BAHA interview 24
[459] BAHA interview 6

Similarly, for BAHA, the cost recovery system may be having a detrimental impact on the extent to which services and programs can be offered. The need to cost-recover may make it difficult for BAHA to implement programs and activities that are not readily cost-recoverable. In some situations, stakeholders considered it difficult or inappropriate to charge fees for certain services. This was particularly the case for the so-called 'public good' services, as reflected in the following comment, made by a member of BAHA staff:

> "*A lot of the things we do is call of the public good, we shouldn't be charging for...and, but it takes money to, to do and so um it might be very difficult to get some of these things done with the limited financial because for like surveillance for instance...we need to do um, for food safety like uh residues in imports...we're not checking imports for residues and we should be doing that and who pays for that? Not necessarily a small importer, it should be a government function that we have a residue plan and that costs money*"[460].

With regulation taking place in the context of very limited resources and with very limited financial support beyond cost-recovery (see Figures 6.34, 6.46 and 6.49), BAHA may have needed, and continue to need, to focus resources on those activities which do operate effectively under a cost-recovery system. There is, for example, a strongly identified need for stakeholder sensitisation including education (Figures 6.31–6.33). This type of work may be difficult to operate on a cost recovery basis, particularly education of the general public, and may therefore be necessarily neglected in favour of more cost-effective activities. Despite the strongly identified need for stakeholder education, identified private sector contact with BAHA showed this to be relatively infrequent, with other activities such as fee payment generally and testing and analyses (for which a fee would be readily chargeable), more common (Figure 6.9). Clearly, this could have significant implications for the agricultural health framework in terms of stakeholder awareness of regulatory measures and controls and, consequently, levels of compliance (see section 6.2.2).

The limitations on BAHA described above have further implications for the agricultural health framework. An emphasis on activities which are cost-

recoverable may lead to weaknesses in important aspects of the framework. Pest and disease surveillance, for example, may be difficult to charge for but is essential for the protection of Belize's domestic agricultural health and export markets. In implementing cost-recovery services there may be a greater focus on exporting producers (or at least on larger-scale producers), who may be in a stronger position to pay for services, than on non-exporting producers. This could lead to important domestic agricultural health issues being neglected with a resulting impact not only on stakeholder awareness but also on the quality and safety of domestic produce. The findings indicate that on several occasions private sector contact with BAHA was related to export requirements (Figure 6.9), and some perceptions indicate that the availability of some services and activities is limited (Figures 6.15, 6.20, 6.21 and 6.29–6.33).

The cost recovery system may also be having a negative impact on overall levels of support for BAHA and the agricultural health controls. As has been seen, there are some negative perceptions of fees and the cost recovery system generally. Other perceptions (expressed by a minority of stakeholders) include negative perceptions of BAHA as 'revenue collectors' (Figure 6.12) and in one case the purpose of regulating is seen as to 'tax the private sector' (Figure 6.3). In cases in which BAHA is perceived simply as a bureaucratic or revenue-generating entity, stakeholder support may be weakened since stakeholders may not perceive the measures and regulations to be necessary, or as pursuing a legitimate objective. As identified by interviewee 1, this may in turn have negative consequences for compliance:

> "*If we continue receiving eh cuts on our subvention and being forced to in a way to increase fees for our services which is basically cost recovery fees the, as is already the stakeholders importers, exporters some look at us as, you know quotes 'tax collectors' which we try to explain to them that we're only charging cost um recovery...we're trying to be cost recovery um and then looking at us you know and then through other means trying to, to, to be non-compliant*"[461].

---

[460] BAHA interview 19
[461] BAHA interview 1

The financial contribution made by the Government is an issue in the context of cost-recovery. As can be seen there is some perceived need for financial input from the Government, particularly in the case of public good services (Figures 6.45–6.49). The present system was intended to minimise this source of income and the extent to which further public funding is desirable is questionable. Such funding would introduce the problems of dependency on public funds that the cost-recovery system sought to avoid. Further financial inputs from government may also be unlikely in the context of the financial resources of the country as a whole. Nevertheless, the findings suggest that in practice the system does not generate sufficient income to enable the provision of services in all areas in which they are needed. The availability of resources and services are perceived negatively on several occasions and in particular there is a perceived need for increased stakeholder sensitisation. It should also be remembered, at this point, that BAHA's mandate has increased since the framework was originally implemented, most notably to include food safety.

One of the objectives of the new framework was to improve the quality and financial viability of services. In practice, as has been seen, it may be difficult to reconcile this objective with the need to cost-recover. Clearly there have been some areas of success. In aquaculture, for example, recognition from the EC of the standard of fisheries products and of BAHA as a competent authority able to implement the relevant legislation effectively,[462] has no doubt been of huge benefit to the industry and clearly BAHA has played an important role in assisting this industry in improving its standards, for example through the implementation of HACCP systems. However, as discussed above, in other areas the cost recovery system may limit the extent to which services are both offered and utilised, potentially increasing some risks to the agricultural sector, the safety and quality of produce (particularly for smaller-scale/domestic producers) and the overall levels of support for the framework.

[462] Belize gained List I status for the export of fishery products to the EU in 2003.

6.2.2 The interaction between BAHA and other stakeholders

The project implementing the present agricultural health framework envisaged a high degree of interaction between BAHA and agricultural health stakeholders. Not only was the private sector to be the primary source of funding for the regulatory framework but it would also play a role in management and decision making, particularly through involvement in the Board of Directors and through 'user groups'. Also, stakeholders, namely the 'general public', would benefit from increased education on, and understanding of, agricultural health issues.

The findings suggest that while some stakeholders have clearly had positive interactions with BAHA, the overall picture is uneven and indicates that a greater degree of interaction is needed.

The findings indicate a strongly perceived need for increased interaction between BAHA and other stakeholders, particularly in terms of stakeholder sensitisation generally and specifically through education (Figures 6.21 and 6.29–6.33). Stakeholder comments highlight the benefits that can be gained from such participation:

> *"Um well to, to the farmers uh to be, like I said education no? It will help I think it would make their job a little easier...um, we have like I said the illegal importation of commodities...it's, it's almost all year round and um, we um we well BAHA shouldn't um expect to just do the job of um catching those persons um and, and punishing them but going a little bit more further in educating those people no?...educating the, the public especially the importers..."*[463]

One member of BAHA staff also highlighted the importance of such contact in terms of enabling BAHA to address effectively the needs of the regulated community:

> *"One of our deficiencies is ah public awareness, we're not um, we're not, we're busy, we're short-staffed, short uh in funds and therefore we're not carrying out a proper public awareness um with stakeholders...We have different partnerships we've developed, meeting with people, the leaders among the stakeholders but it's not the same as meeting with the farmer in the rural area...and we need to develop (this) where we can also probably*

[463] BAHA interview 46

look at the, address their needs and, and hear their voice, we only hear the voice of the leaders representing them"[464].

This type of involvement with stakeholders is seen, therefore, as a tool for increasing support for, and compliance with, the agricultural health controls.

The use of user groups was commented on favourably in a few cases but, as mentioned, there was a perceived need for increased contact between BAHA and its stakeholders (and negative perceptions and difficulties were identified in some cases commenting on a lack of contact with, and participation of, stakeholders (Figures 6.12, 6.18 and 6.20)). Other perceptions of the framework are mixed and indicate that while some stakeholders have had positive experiences of BAHA in other cases there is a lack of support for the framework (Figures 6.12–6.13, 6.14–6.15 and 6.18–6.19) The findings suggest that there are in fact some difficulties concerning stakeholder awareness and understanding of the framework (see Figures 6.1–6.6, 6.20 and 6.33). Almost all interviewees referred to at least one specific agricultural health measure and in the majority of cases these measures were supported (Figures 6.7 and 6.16). Difficulties, however, can be seen from cases in which specific measures or legislative provisions were not supported. In those few cases the perceptions usually related to import controls with the stakeholder being unaware of the purpose of the measures taken. One stakeholder comments, for example:

"*And, and so we went through this whole, you know convoluted, bureaucratic process of getting the product inspected et cetera but it was never really quite obvious as to why...you know? It's kind of like uh, we're supposed to do it ok but what is, what is the underlying reason for doing this, what are we hoping to accomplish by doing so and if in, what even are you looking for and if you find it what then is the next step? Uh, and, and none of that was very clear*"[465].

The need to control pests and diseases was one of the most commonly identified objectives of the agricultural health framework (Figure 6.3) indicating that theoretically such measures are supported. There is a difference then, between that identified objective and the experience of some stakeholders in actually

[464] BAHA interview 3
[465] BAHA interview 22

encountering measures designed to achieve that objective. The mixed perceptions of the role of BAHA and of the purpose of regulating agricultural health suggest that perhaps these also have not been clearly communicated to the stakeholder community (Figures 6.1–6.6). Even key specific issues such as pest and disease control, are not identified by a majority of stakeholders. This suggests that while the steps taken thus far to increase awareness and understanding of agricultural health issues are supported there is still an issue of lack of awareness and it is widely perceived that awareness must be increased. The most obvious way to achieve this, as identified and supported by stakeholders, is through the implementation of public awareness and education programmes.

In terms of the private sector there are other issues beyond the general need for education. Most private sector stakeholders have had some type of contact with BAHA and as has been seen this contact is primarily administrative- or enforcement-based (and often for export purposes), rather than educational or collaborative (Figure 6.9). A number of private sector stakeholders though identify benefits arising from the framework (Figure 6.25) and the private sector did not identify a need to increase stakeholder sensitisation solely, when expressing a need to increase contact between BAHA and stakeholders (Figure 6.32). To some extent then, this interaction appears to have been successful. However, the need for active participation and collaboration was important to some private stakeholders: "*...but uh, having them um, sit down and discuss things how we feel I would kind of uh sometimes like to uh, to explain them how we feel...and have them understand not just um, that, that's human nature isn't it*"[466]. There was also some perceived need for technical assistance. These findings suggest that while BAHA's involvement with the private sector has to some extent been successful, it is still not fully satisfactory, from the point of view of the private sector stakeholders.

As discussed, the levels of awareness and participation may be insufficient to achieve effective regulation of agricultural health. If stakeholders do not

[466] BAHA interview 44

understand or are not aware of the purpose of agricultural health controls compliance levels may be adversely affected, either through ignorance or through intent caused by lack of support for those controls. Aspects of the findings suggest that this is already so in a minority of cases. Apart from the negative perceptions discussed above, identified problems related, on several occasions, to a lack of compliance with and/or awareness of the controls (Figure 6.20). Problems such as 'contraband' have important implications for Belize's agricultural health framework since a lack of compliance could lead to the introduction of pests and diseases, with serious implications for Belize's agricultural production and access to export markets. As well as general negative impacts on the regulation of agricultural health, the lack of stakeholder participation and education could impact on another objective of the framework, namely the improved quality and safety of domestic produce. A lack of awareness of controls and difficulties with compliance may have a lesser impact on exporting producers than on those producing only for local markets since exporting producers and processors may benefit from contact and regulation from sources other than BAHA (see sections 6.2.5 and 6.2.7). Larger producers and those exporting are also likely to suffer less from the impacts of fees and this then will be less of an obstacle to compliance. In practice this means that the consequences of lack of awareness or support, caused by lack of interaction, and consequent non-compliance, will have the greatest impact on domestic-market producers. There is therefore, a need to ensure that education and participatory activities reach these producers and processors.

Clearly, there are limited resources with which to implement the types of activity referred to above and activities such as public awareness campaigns and stakeholder education may be difficult to implement within a cost-recovery system. A further difficulty arises, however, because of the apparent discrepancy between the overall need for contact, and the types of contact needed identified by BAHA staff, as compared with other stakeholders (Figures 6.30 and 6.32). This difference in perceptions could contribute to problems within the regulatory framework since the types of work which stakeholders perceive as needed are unlikely to be pursued if the regulatory body does not share this view. Resources,

identified in the findings as limited (Figures 6.34–6.35), might not then be used as effectively as they could, since they will be focused on other activities.

As seen above, education and stakeholder participation are tools that can be used to increase levels of awareness and ultimately compliance amongst stakeholders. In the present case, there is a strongly perceived need for BAHA to increase the extent to which it interacts with stakeholders, an apparent lack of awareness of the purpose of regulating agricultural health and, in some cases, a lack of support for, and understanding of, the controls and problems of non-compliance. It is suggested that the objectives of public awareness and private sector participation have not yet been fully realised and as such there may be negative implications for Belize's agricultural health, particularly in terms of domestic health and production. Stakeholder education should be increased but it is important for BAHA to increase the extent of collaborative activities with the private sector, as well as 'top-down' public awareness and education.

6.2.3 The legislative framework

Comments related to the legislative framework are mixed and indicate that stakeholders are having differing or uneven experiences of the legislation (Figures 6.17–6.19 and Appendix 7, Tables A7.2 and A7.3). These uneven experiences and perceptions indicate that there are a number of difficulties with the legislative framework, which in turn have implications for enforcement and compliance.

It can be seen that a number of issues were perceived in both positive and negative terms (Figures 6.18–6.19, Appendix 7, Tables A7.2 and A7.3). These issues are commented on most frequently by BAHA staff members and these findings suggest that the legislative instruments and provisions themselves may be of varying 'quality' (in terms of scope, clarity and so on), so that staff members dealing with one set of regulations may have a very different experience to those dealing with a different set of regulations. Similarly, the mixed perceptions held by other stakeholders, including the private sector, suggest that the implementation of these provisions has also been uneven. In particular, mixed responses were coded relating to private sector perceptions on 'support and understanding' and 'advantages' and 'disadvantages'.

These perceptions of the legislation may impact perceptions of the framework overall. For example, the extent to which it is perceived that effective regulation is actually possible, within the scope of the legislation, may be negatively affected where the legislation is considered to be inadequate. General levels of support might also be affected; for example where participation is perceived to be inadequate this may weaken the levels of support among those relevant stakeholders. Differing experiences of advantages and disadvantages of the measures and controls and of difficulties with the clarity of regulations might influence the levels of compliance of private sector stakeholders. One reason for this is that a perception that the measures are disadvantageous clearly could affect stakeholders' willingness to comply (with the converse being so where advantages are perceived). Another reason is that in instances in which regulations are not

clear these difficulties could also make it difficult for producers and processors to comply in practice.

The identified difficulties with the legislation may also indicate, or lead to, problems with enforcement. While some aspects of the legislative framework appear to be strong, others may be less so. For example, while some BAHA staff found the regulations sufficiently clear, others have identified problems with the interpretation of the regulations. Such difficulties mean that enforcement may not be consistent since officers may be unsure of how to interpret a particular provision and interpretation, and so guidance or enforcement action, may vary from case to case. Identified gaps or problems with the scope of the framework could indicate that important areas are being neglected or, alternatively, that controls are being implemented with no legislative basis and could, therefore, be challengeable.

The difficulties discussed have further implications for the effectiveness of the framework. Inconsistent, or possibly incorrect, interpretations and application of regulations, due to a lack of clarity, for example, could lead to increased risks from pests and diseases or to a decrease in levels of product safety and quality, if enforcement is not carried out in line with the intention of the legislation.

Some of the difficulties described by stakeholders can be linked to the difficulties in amending the primary legislation. Certain areas not provided for in the original Act, but which have subsequently become important, such as food safety and a proposed scheme of certification for citrus, have not yet been addressed in the primary legislation. Instead, some stakeholders indicate that secondary legislation has been used to address gaps, conflicts and other difficulties and priorities. The benefits of using SIs, in terms of avoiding the legislative process required for primary legislation, are commented on by one member of BAHA staff:

> *"...Uh it is or has been quite dynamic the, the legal aspect because we, we're continuously trying to catch-up with some thing...and hence the reason there, you know there are so many recent SIs...cos something was passed and then we realised didn't work and there was really you know, a, didn't contemplate some aspects so we had to go back and, another*

> *SI...more complicated or, or, or more wider encompassing, to be able to. And we have been dealing with these aspects through an SI system cos it's quicker*"[467].

This has been so, for example, with food safety where BAHA's powers and mandate for food safety have been introduced through the Food Safety Regulations 2001. Another member of BAHA staff illustrates the difficulties of this approach: "*In the absence of those regulations in an effort to try to be outing fires...we have passed, in my opinion too many statutory instruments under the BAHA Act...and in certain instances um, there's a conflict, like one might say one thing and the other says another*"[468].

Clearly, in such circumstances, there is a need for a proper system of amendment and for recognition of the proper limits of different legislative instruments. There is a need to amend the primary legislation to take into account current problems and priorities but this of course is subject to the general bottlenecks in the legal system which have prompted BAHA to address the problems through secondary legislation. Included in this are some issues where in the circumstances this might not be suitable and could in fact weaken the framework by opening it up to challenge. A need to keep the legislation updated in line with international developments was also identified in a few cases and this again means that a more effective system of amendment may be needed.

As mentioned above, perceptions of the legislative framework were mixed and some aspects of the framework appear, therefore, to be successful. Paradoxically, despite the lack of provision in the primary Act, clear progress has been made in the area of food safety most obviously in the context of the aquaculture industry (see section 6.2.1, above). Benefits of the framework were identified not only by the aquaculture industry (who also most frequently identified the framework as having positive impacts on the private sector) but also by some other processors and producers (Figure 6.25). There are, however, ongoing difficulties with overlapping mandates for food safety and some comments did indicate that there are problems with achieving successful regulation (see section 6.2.5). While some

[467] BAHA interview 4

issues, such as the level of support for, and understanding of the controls and the participation and involvement of stakeholders, might be addressed, at least in part, through non-legislative means, such as education, consultation and the use of Memoranda of Understanding (MOUs), for example, the findings suggest that some of the identified deficiencies might only be properly addressed through the development of the legislative framework. There is a need for a strong legislative framework which is up to date and in which the *de facto* priorities of stakeholders (primarily the regulatory agency and other relevant authorities such as those of the parent Ministry) are reconciled with the legislative provisions. In this respect it appears that there are still some areas to be addressed.

[468] BAHA interview 9

6.2.4 The autonomy of BAHA

The issue of autonomy arises in two contexts. The first is the extent to which the Central Government does, and should, provide support to BAHA (see Figures 6.45–6.49). The second concerns the extent to which BAHA does, and should be able to, exercise powers of decision making independently of its parent Ministry (see Figures 6.50–6.52).

One aspect of government support is the extent of financial support that is provided to BAHA. The perceived problems with financial support concern the lack of that support and the consequent impact on the extent to which BAHA is able to carry out services as well as the impact on the private sector (see Figure 6.49). This relates back to the issue of cost-recovery. As discussed above, several interviewees considered that there should be a greater degree of support from government, particularly in the case of 'public good' services. It can be seen that the availability of resources is perceived as limited and in some cases particular services or activities are seen as lacking (Figures 6.15, 6.20, 6.21, 6.31 and 6.34–6.37). As seen in section 6.2.1, the cost-recovery system may not enable adequate revenue generation to implement all necessary programmes and policies. The extent to which increased financial support from government is likely or desirable is discussed above but the lack of such funding does appear to limit the extent of agricultural health regulation.

A lack of political support was also identified (Figure 6.49) and may further limit BAHA. A lack of political support was identified in some specific contexts but a comment from one private sector interviewee highlights the more frequently identified problem of a general lack of support for BAHA and the regulatory framework:

> "*It seems to me that um the, the initial enthusiasm and the initial support for that legislation has been lost at some point...so the concept, the concept is there its only, it hasn't materialised to the point where it is uh, at a, a hundred percent...uh I would say it's only at about forty percent, that has been accomplished, it's been, it's a legislation now, the laws are*

there...the enforcement is, is, is, starting to, to go out there but it, there isn't the support from, from, from government"[469].

Without this support BAHA may not be able to implement policies successfully. In cases of direct conflict, as suggested in Interview 8, for example, BAHA may find that other policies undermine the controls that they attempt to implement:

"*Interviewer: Ok. To what extent do you think that um, for example that implementing the SPS Agreement has um, how has it affected the, the policies or activities carried out by BAHA? As far as you know?*

Interviewee: Mm. They, they feel, to me they feel limited because of the Government's policy on this agreement...cos BAHA is for the compliance of those agreements...for those international agreements and the Government's policy is, is like contradictory to those agreements, cos they're still have commodities that are (sensible?) for trade...and if you follow on the SPS Agreements you can trade anything once you have the, the standard...but then Government doesn't want to do that because it will leave out small farmers, small producers"[470].

BAHA may also encounter implementation problems concerning the extent to which other government bodies are willing to co-operate with them where there is a general lack of support for those activities from central government or the Ministry.

Issues related to the exercise of decision-making powers were identified in several cases, including references to 'intervention' (Figures 6.12, 6.15, 6.18, 6.20, 6.42–6.44 and 6.50–6.52). These responses often refer to the extent to which the Ministry, or the individual Minister, exercises decision-making power concerning agricultural health that may conflict with or override the powers of BAHA. This problem appears to relate, in part, to the legislation which affords decision-making power to the Ministry. The problem was summarised by one member of BAHA staff:

"*There is one, one issues that, you know, has always been a problem in the way the, the, the legal system in Belize works...which gives the Minister a lot of powers to, to um, to, uh...Yeah it gives the Minister a lot of power to do um things that at times we, would go against the recommendations of*

[469] BAHA interview 39
[470] BAHA interview 8

BAHA...I think that's one of the, that's, that's one of the weaknesses that, that we have in the system"[471].

Comments on the exercise of decision-making powers by the Minister/Ministry, including intervention with enforcement, can be seen at Figure 6.52. Concerning the approach to enforcement, another member of BAHA staff comments,

"*It has been very difficult...and mostly because of political um intervention, um the Belizean culture allows for easy access to, to politicians...who have um, who appear to have every right to, to uh speak directly to the people concerned and, and have them do what they want them to do*"[472].

The dangers posed for agricultural health are illustrated by Interviewee 4, also a BAHA staff member:

"*...Under our system the Minister has the final say, and I believe that's a dangerous combination...because uh, we have had the cases where some ministers have called either the managing director or, or, or director or even an employee ...to give a directive, 'Let this happen', or 'Allow this to come in,' while it is a high risk commodity or when it poses a phytosanitary or sanitary risk to the country or when it's coming without the, you know, proper documentations or whatever and under laws of the country the Minister has that right and uh, and that is very dangerous because that can really put the country at risk just because of a political whim...or because they're facilitating a friend or something*"[473].

If intervention is a problem, as suggested by the findings discussed above, this clearly has significant implications for the regulation of agricultural health. One of these is an increased risk of the entry of pests or diseases or other unwanted commodities (for example, in the case of food safety controls). While import controls implemented by BAHA should be based on risk assessment, this, as indicated in interview 4 (above) may not be the overriding concern if entry is granted under other circumstances. Another implication is an impact on stakeholder perceptions of BAHA and of the controls. If it is perceived that the controls can be circumvented or are not effectively enforced this may weaken support for BAHA and may lead to lower compliance levels — the issue of contraband has been seen to be one of the most commonly identified problems

[471] BAHA interview 2
[472] BAHA interview 3

(Figure 6.20). This again has implications on the state of agricultural health. Even if stakeholder perceptions are at odds with the actual situation, and intervention is not a problem, this perception could itself still have a negative impact on stakeholder perceptions of this issue and on compliance levels since there could still be reduced support for BAHA and the regulations.

Another issue is the exercise of ministerial powers to prevent imports, in order to protect domestic industries. This is suggested in interview 8, above[474]. Such action could clearly cause problems in the form of unjustified trade barriers, contrary to the rules of the WTO trading system. Any unjustified action in this respect would potentially allow other WTO members to initiate a dispute, within the WTO framework, and could therefore have negative economic impacts on Belize, including the agriculture industry, for example, if Belize were subject to economic sanctions.

The BAHA Act is not unusual in providing general decision making powers to the relevant Minister. However, the Board of Directors is, according to the Act, the policy-making arm of the Authority and general ministerial powers are not usually intended to be exercised for the day to day running of an authority. As such the exercise of powers by the Minister may, in some cases, be challengeable (for example by persons with sufficient *locus standi,* perhaps including aggrieved importers, through judicial review) thus weakening the strength of the regulatory framework overall. The exercise of decision-making powers outside of the Board of Directors (on policy direction) also has implications for the extent to which different interests are represented in such decision-making. The implementing project envisaged a high degree of participation from the private sector and the composition of the Board laid down by statute provides for participation by a range of interested stakeholders, including private and public sector stakeholders. A lack of such participation may exacerbate some of the issues concerning perceived lack of collaboration, overlapping mandates and so on.

---

[473] BAHA interview 4

[474] See also the comment by BAHA interviewee 13, below, related to the imposition of quantitative restrictions.

The overriding issue is then the extent to which BAHA should operate as an autonomous or semi-autonomous statutory agency. On the one hand there is a perceived need for greater input from government, in terms of support (including support for policies); on the other hand, there are problems with the exercise of decision-making powers. It is perhaps not surprising that in a situation in which resources are limited and the private sector is small, there would be a perceived need for greater financial support from the Government and this then should perhaps not be over-emphasised. A lack of political support could have more significant implications because of the possible impacts on BAHA's ability to implement necessary policies and programs (including the need to comply with international obligations). Similarly, though the exercise of powers by the Minister will be appropriate in some circumstances, these should not usually be exercised for routine decision-making. Clearly, there is a need to strike a balance concerning the autonomy of BAHA and at present would it appear that the necessary balance has not been struck. This in turn causes difficulties for the effectiveness of the regulatory framework, as discussed above.

6.2.5 The role of third parties in the regulation of agricultural health

It can be seen that a variety of third parties were identified as playing a role in the agricultural health framework in some capacity (Figures 6.38–6.41 and Table 6.2). Such involvement presents an opportunity to overcome some of the difficulties identified elsewhere through enhanced co-operation over regulated activities and through the use of available technical and financial resources.

The involvement of government bodies, particularly in a regulatory capacity, was frequently identified and has the potential to strengthen the regulatory framework by enabling a thorough and coherent regulatory environment in which different agencies work efficiently together. Identified weaknesses in the agricultural health framework (Figure 6.15) include financial resources and technical capacity. Involvement of these other bodies could facilitate more successful implementation and enforcement through, for example, the efficient sharing and use of resources. The findings indicate, however, that the involvement of these government bodies is not as effective as it could be.

Two main issues were identified as weaknesses: firstly, problems related to overlapping mandates or lack of clarity or agreement on the responsibilities of different bodies, and, secondly, the decision-making powers exercised by other bodies in relation to BAHA (Figures 6.42–6.44). The issue of decision making with respect to the Ministry of Agriculture has been discussed elsewhere (see section 6.2.4). It is worth noting that in a small minority of cases comments were made concerning the involvement of other ministries, at a more general level. One NGO/regional organisation representative illustrates the problem:

> "*...In the sense that you talk there about in the, in the, in, in BAHA about all these regulations and plant and animal health...but yet a lot of the, the final decision...is made from a different ministry here in Belize, whether it be the Ministry of Trade, or the Ministry of Investment, so they have not been that, that link, there is a, a, legal framework with BAHA but it's not the final...say, unfortunately. It's not the final say no. They would present a, a, a scenario on a technical, on a scientific point, but the system undermines BAHA in the sense that the final decision is not necessarily, lies on a technical standpoint, it's, it's a different ministry who may not be versed or fully participating in the case in Belize there're several ministries*

that have not fully participated with BAHA and, and that's one of the unfortunate, it's a good legal framework yes but um, at the end of the day BAHA doesn't have the final say which is unfortunate"[475].

This again illustrates the potential for decision-making which contradicts BAHA's own decisions and controls and which might even lead to challenges, particularly in the context of international trade. The comment above again perhaps implies the application of unjustified restrictions on imports through the imposition of quantitative restrictions or decision-making that is not based on risk assessment.[476]

The issue of overlapping mandates and related problems is also of concern. The problem in this case relates primarily to the overlap between BAHA and the Ministry of Health over food safety regulation. Some interviewees, for example, describe a system in which both bodies are attempting to regulate the same areas:

"*...And there's some overlapping, like um, in the plant health area we have the Ministry of Agriculture, those guys do um extension service...and it's free of charge but our guys, since we have to be self sufficient we do something similar but there's a charge attached to it and also in the meat inspection area the public health um inspectors does meat inspection but their regulation does not provide for a fee, for them to charge a fee...however BAHA does so and, and um, that's where the, where the friction lies sometimes no? Because if you can get a service free of charge you won't pay*"[477].

Clearly this type of overlap can involve a waste of resources. However, a further difficulty arises from the interaction between competing mandates and BAHA's cost-recovery system. As the quotation above suggests, service-users will not want to pay a fee for a service if they can get it for free. This could lead to a dual-regulatory system in which some food processors are regulated by BAHA, and some by Public Health. The problem arising is that differing standards may be applied by the different agencies and that this may lead to lower standards overall, with service-users choosing which body to be inspected by. One member of BAHA staff indicated that this has arisen in practice on at least one occasion:

---

[475] BAHA interview 13
[476] See also section 6.2.6
[477] BAHA interview 24

> *"Now in one of the Mennonite communities there's one smaller facility that we've been involved with um and this guy has been consistently uh negative, doesn't want us there, prefer when Public Health was there, Public Health was there sporadically and things like that, there was no fees charged or he would just pay the inspector something or you know, that, that's possible, um so when we came in there and starting to demand more and the hygiene there was suspect and all of this stuff there, he basically decided one day that we should be out and out of there so Public Health took that on and they went in there on a full time basis...so Public He-. Because we have this dubious regulation where it's not, we're not so sure it's BAHA fully responsible or Public Health, we could not go in there, and says that no this is not a Public Health thing this is BAHA and we're gonna, because you're not complying we're gonna shut you down..."*[478]

A large part of the problem in this case clearly lies with the legislative provisions. The difficulties related to BAHA's mandate for food safety are discussed elsewhere (see section 6.2.3). Aside from this it appears that the working relationships between these different bodies are problematic and that day-to-day service-provision has not been successfully addressed (though some stakeholders did indicate that progress has been, and is being, made in this respect).

Assistance to the private sector is an area in which third party involvement appears to be less problematic. Various third parties are identified as providing advice and technical assistance (see Figure 6.40 and Table 6.2). This involvement may in practice address some of the identified weaknesses or areas in which work is perceived to be needed. For example, although there is a strongly identified need for BAHA to be more heavily involved with stakeholder education (Figure 6.31), in some instances the private sector may gain advice from other sources. Similarly, although there was some identification of a need for BAHA to increase their provision of field services, it can be seen that some assistance is provided by the agricultural extension officers and this may in fact address some of those needs. The influence of 'external' regulations and authorities is discussed elsewhere, but it is important to recognise at this point that for exporting, private sector stakeholders, BAHA is in fact not the only relevant regulatory agency, and may

[478] BAHA interview 19

not even be perceived as the most important. In those cases in which standards are maintained for the purpose of compliance with importer requirements, the associated regulatory agencies may play a significant role in the enforcement of agricultural health controls, for example, through auditing.

Identified weaknesses with third party involvement generally did not refer to private sector support (Figures 6.42–6.44) and it therefore appears that this involvement has a positive impact on the regulatory framework. Although third party involvement in supporting the private sector can be seen as beneficial, it must be recognised that this does not negate the need for BAHA to maintain certain types of involvement. For example, although there may be some instances in which public education can be carried out by other bodies, this will not necessarily relate to the specific needs of those stakeholders with relation to BAHA. A possible concern arises also in relation to non-exporting or small-scale producers and processors. These stakeholders will not gain input from importing authorities and may not be able to pay for assistance from consultants. There is, therefore, a clear need for the regulatory agency to ensure that certain types of support are available across the whole private sector, and this is likely to involve such support being provided by BAHA.

As well as assisting the private sector, third parties also play an important role in assisting the regulatory agency (Table 6.2). 'Development agencies' in particular can also be seen to play an important role through the provision of financial and technical support (Table 6.2). Such assistance can greatly benefit BAHA. For example, some of the difficulties concerning programs that are difficult to run on a cost-recovery basis can be addressed, at least in part, through this type of involvement. The MedFly Program, for example, has been funded through such assistance. These agencies play another important role in terms of assisting BAHA in participation at the international level. Such participation not only assists regulatory agencies in keeping up to date with relevant developments but also in contributing to new developments. Perhaps the only limitation in this respect is that these bodies do, of course, work according to their own objectives and

agendas, which may not always reflect the priorities of BAHA. Thus, although some of the problems related to, for example, limited financial resources to implement programs, may be alleviated by the involvement of these bodies and agencies, such assistance cannot be regarded as a 'fix-all' alternative to problems such as under-funding.

While the inputs of third parties are clearly beneficial, in most cases, it is important that this involvement is as effective as possible. In some cases it was considered that in order to strengthen the involvement of these various bodies, there should be a formalisation of their involvement or at least that there should be increased communication or strategic planning concerning that involvement. A member of BAHA staff provides one example, concerning the involvement of the various industries:

> "*A lot of them, well all of them right now are informal...so there's no um, and that is why commitment is, is, is poor aside from the poultry association, they have a high commitment so even though it is an informal arrangement it is very successful...but with the other sectors that, that they're not made de-, with poultry association a lot of the issues revolve around poultry health...and that is why the committee...but (with cow??), for example, there are so many other issues that having an informal thing then uh they're not as committed. And I would say that for the other organisations as well. So I was hoping to um, to make it formal*"[479].

It can be seen that the involvement of bodies on an informal basis may limit the consistency and in turn, the overall value, of that involvement. The implementing project listed the use of 'committees' as an objective and in some cases, where they are in existence, these seem to be perceived positively. An increase in the use of such committees would, perhaps, be a useful way to secure on-going inputs and to avoid the 'fire-engine' approach identified on some occasions.

[479] BAHA interview 3

6.2.6 The impact and perceptions of international sources of law

It can be seen that stakeholders recognise international sources of control as being both advantageous and disadvantageous to Belize and the regulation of agricultural health (Figure 6.55). International standards and standard making bodies were the most frequently identified of these sources (Figures 6.53–6.54). These standards, it was recognised, can be beneficial in providing clear and consistent standards which can be adopted where there are no national standards and which are internationally recognised and thus facilitate market access and compliance with international obligations. Such benefits are illustrated by the positive awareness and perceptions of HACCP among the private sector, for example (Figure 6.54).

The implementation of these standards and of other international controls however, can be seen to cause some difficulties. Identified disadvantages (Figures 6.55–6.56) suggest that there are some negative impacts arising from the implementation burden associated with international sources and that these affect both BAHA and the private sector. Disadvantages most commonly related to the cost and resource implications associated with implementation and compliance. For example, the benefits of achieving disease free-status were noted, "*I would say, I would say a couple of advantages... you know we, we've been, we've been recognised as, as a Med. fly free...and because of that we have a very strong papaya industry*". The interviewee goes on to note, however, "*um, but again the disadvantage it would be having to sustain the, the, the surveillance*"[480]. A government official, also a Board member, notes that,

"*...You have all this SPS stuff, have demanded a lot more from, from us...we, we (sign) to something and then we have to invest a lot more and in terms of its cost on per capita it's far greater than some of the bigger countries cos (at the end?) you are required to have the same regulations and the same everything yet you have a small population to be with and a smaller clientele to try to cost recover that...and that has been some of the difficulties for BAHA. So it, it has had some financial implications that has created the challenges that BAHA have at the moment*"[481].

---

[480] BAHA interview 11
[481] BAHA interview 14

Difficulties such as those described above, and identified in Figures 6.55–6.57, indicate that while these international sources of control are important in strengthening the agricultural health framework and the agriculture sector overall, the advantages may be negated or lost by the identified difficulties. For example, resources are already considered to be limited and the costs incurred by both the private sector and BAHA for the implementation of these controls will exacerbate existing difficulties and, although enabling advantages, may also cause disadvantages in situations where the regulatory framework suffers due to this lack of resources.

Other disadvantages related to the extent to which Belize is able to benefit from, and participate in, international agreements, as a small developing country. The importance of such participation is commented on by a number of stakeholders, for example:

> "*Because if, if you're well versed in, in what they are and you had a say and you were part and parcel of, of, of drafting and, and commenting...then you can, you can, you can then make sure that, that there's certain things in there for your advantage...on the other hand if you're not part and parcel of it and then it comes into, onto being, you just have to play the game*"[482].

There were, however, some observations that, despite assistance from third parties (see above), effective participation may still be limited. The problem is illustrated by a member of BAHA staff:

> "*I think one of the limitation is the, is that the bigger countries tend to set the pace...they, they tend to, they're the ones who lobby for the different standards to be adopted and small countries like Belize it's, it's kind of difficult for us to really make um they say it's transparent and everything but I think it's the more developed countries that if they want to have a standard adopted then they, they push for it and most of the smaller countries just tend to follow*"[483].

Another notes,

> "*One thing we didn't realise with that is that it's not just a matter of um, of being members and, and, and voting at meetings...but it's also um, participating in all the discussions leading to, to um standards being*

[482] BAHA interview 27
[483] BAHA interview 2

formulated so a lot of times we get a lot of um, lots of information...which we don't have the people to, to really um, review the amount ( ) so we tend to just be very passive, we go and we vote but we haven't really participated in the discussions because sometimes it requires money to go to the meetings or even haven't had the time to read the documents that they provide"[484].

Following on from the problem of not being fully involved with the development of standards or agreements, another stakeholder suggested, by analogy, that small countries such as Belize were not in a position to derive the same benefits as the larger, or richer, countries: "*Um, the disadvantages is, it, it, it well, stemming out of the not being involved, fully involved or deeply involved, the, then, then you have a number of disadvantages and it's like saying um, let's leave from here to head to Belize City, but somebody is in a, is in a Ferrari, and you are on a bicycle*"[485].

It can be seen that there are challenges related to effective international participation. Without effective participation in the development of these agreements, the interests of Belize may not be reflected in the outcomes, as suggested by the stakeholders quoted above. Implementation difficulties, in terms of financial and other resource requirements, and disadvantages, reflected by stakeholder perceptions that Belize was unable to derive the same benefits as other countries, may be linked to this lack of participation. This again was noted by one or two stakeholders. Effective participation is also necessary to enable Belize to achieve compliance and effective regulation through awareness of developments and through information sharing. Difficulties may also arise from the perception that Belize does not derive the same benefits as other countries and does not participate in agenda and standard setting. Such perceptions could potentially lead to lower levels of participation, for example, where outcomes are perceived as a 'done deal'. This would add to the difficulties of lack of participation described above, with countries such as Belize merely 'receiving' outcomes and agreements. Despite the well-documented difficulties for small, developing countries in international participation, and the international responses which have been

[484] BAHA interview 3

suggested and developed to these problems, it appears that the ability to participate and contribute at the international level is still a difficulty for Belize.

Apart from the identified disadvantages, the extent to which these international sources have benefited the regulation of agricultural health, and the development of the agricultural sector generally, also appears to have been restricted by national implementation and compliance difficulties (Figure 6.57). A lack of resources and infrastructure, and the cost of implementation and compliance were perceived by some stakeholders to be obstacles to compliance. ISPM 15, for example, is noted by one stakeholder to entail increased costs to a range of parties with the result that implementation is being delayed:

> "*...Whatever the case we decided let's put a hold for us to, to, to, co-, to implement the standard because it will imply other costs, beside to having to comply with the standard if we implement our inspection, we'll have to do more inspection, our importers they will have to incur even more costs so that will be, first they will pass that cost to the consumers, so we really have to be very careful if we implement or we don't implement the standard*"[486].

Issues such as the involvement of central government and the Board of Directors, and conflicting policies or controls (identified in Figure 6.57) will restrain the extent to which BAHA is able to comply with international requirements and obligations and could potentially lead to a trade dispute or a challenge against BAHA. One stakeholder commented specifically that the operation of quantitative restrictions contradictory to BAHA's own regulations was a problem and could lead to importers challenging BAHA.[487] The findings indicate that again the advantages of international standards and agreements may not be fully realised; in this case because compliance may not be achieved.

International environmental agreements appear to have a very limited influence in the agricultural health framework (Figures 6.58–6.60). Since no particular problems or difficulties specifically related to environmental controls were identified, it appears that the influence of these, on the agricultural health

---

[485] BAHA interview 27
[486] BAHA interview 4

framework, including that of international environmental agreements, is satisfactory, from the point of view of interviewed stakeholders, and does not represent an area of concern. This may change with the implementation of the Cartagena Protocol, impacting, as it does, on both agricultural health and biodiversity. BAHA is the focal point for the Cartagena Protocol and was identified as such as on two occasions.[488] Interviewee 17 recognises the potential for development in this area: "*As far as I know is that this Convention on Biological Diversity is managed by Ministry of Natural Resources right?...but the focal point of the Cartagena Protocol lies with the, is, is a director of BAHA...so I think that the involvement of BAHA with natural resources is coming*"[489]. Clearly there may be greater interaction in the future between Belize's agricultural health and environmental protection frameworks. Belize's biosafety framework is still being developed but comments that there is a lack of policy direction in this field suggest that there are still issues which must be resolved in order for BAHA to be able to carry out this role effectively.

---

[487] BAHA interview 9
[488] In one interview BAHA was identified as the 'focal point (BAHA interview 17) and in one interview it was identified as the 'implementing agency' (BAHA interview 19).
[489] BAHA interview 17

6.2.7 The influence of 'external' sources of control on the private sector

Controls originating outside Belize can be seen to have a significant influence on the practices of private sector stakeholders. International standards, particularly the implementation of a HACCP system, were frequently identified by the private sector (Figure 6.54). HACCP was perceived as being linked with market access but was not necessarily associated with BAHA or identified as a domestic control (see Figures 6.8 and 6.54). The regulations and requirements of importing countries are also commonly identified by the private sector and importing authorities were identified as third parties (Figures 6.8 and 6.38–6.39). As has been seen, in some cases stakeholders commented that changes had been made because of those requirements, rather than in response to BAHA's regulations. The extent to which external sources of control and importing regulatory authorities influence private sector practices mean that in practice domestic controls form part of a larger regulatory framework for exporting producers and processors. The influence of controls such as HACCP may be advantageous to the exporting private sector in providing consistent standards acceptable to importing countries and the influence of other authorities may in fact be beneficial in facilitating the private sector in meeting export requirements.

As well as directly influencing private sector practices, importer requirements may also influence the role that BAHA plays for these exporting stakeholders. As would be expected, for many of these stakeholders BAHA's role is based primarily on assisting them in being able to export their goods. As seen in Figure 6.9, private sector stakeholders had contact with BAHA in a variety of different capacities and on a number of occasions contact between the private sector and BAHA is related to the need to meet export requirements. On some occasions private sector stakeholders go further and identify BAHA as carrying out activities at the producer or processor's request, because they are required by **importers**, or appear to perceive BAHA's role as assisting them with complying with **external** requirements. The analysis of samples, for verification following the processors own testing, is one example: "*Ok, as I said it would be mostly for, for um, certification um, like certificate of origins, um, certificate of analysis, which in*

that case they would do, ( ) some samples to them and they would analyse, um, just to verify of course what we do...some, some, some, some customers do ask for that"[490]. A similar comment is made by Interviewee 38:

> "*Um, they do like, they test our water for us from time to time...they, they do and as I said these tests ( ) tests whenever the Japanese asks for it, cos we have to do periodic testings, and due to our expansion too I think (that some of those) tests we will, we will do in-house ourselves. Because we are getting more and more equipment to um, to make sure that we, we can do some of those tests...uh we will still have to continue testing the water to make sure that ( ), cos with HACCP it's not only just that I am telling them oh yes I have put in an ROA system there and it has ultra-violet light and all that, they're going to want to see it in writing...so even though we have that in place I will still have to use BAHA from time to time*"[491].

The influence of these external sources appears, therefore, to affect the role that BAHA plays for the private sector. To some extent these exporting stakeholders appear to perceive BAHA as a body existing to enable and facilitate export, through the provision of services, rather than as a strict regulatory agency for agricultural health. In some respects, this may be considered a strength of BAHA (and is in line with the role of regulatory authorities in undertaking activities to ensure compliance with export controls, as discussed in Chapter 1). The types of service most commonly required by exporters, such as provision of documentation/certification and inspection or analyses for compliance with external controls, appear to be being effectively provided by BAHA and, from BAHA's perspective, these are more easily cost-recoverable than some of the 'public good' services (discussed in section 6.2.1). Importantly, one of the original aims of the agricultural health framework was to encourage and facilitate agricultural exports. It appears that the present system does in fact achieve this since private sector stakeholders appear to use a mixture of different controls and standards to access markets and are assisted by BAHA in achieving compliance with these.

While the cost of compliance may be an issue (this was identified as a 'problem' with the agricultural health framework, see Figure 6.20), in the case of exporters

---

[490] BAHA interview 37
[491] BAHA interview 38

this should be considered in light of the financial benefits of market access. These external sources of control are designed to achieve particular standards, for example, in terms of food safety and are not necessarily designed with ease of compliance in mind. In this respect the cost of compliance in particular may be a difficulty (though this was identified in terms of agricultural health requirements generally, including those applying to non-exporting producers/processors) but overall the implementation of these standards by the exporting private sector was not identified as a problem.

A further issue is the extent to which standards such as those necessary for export should be applied to non-exporting producers and processors. While domestic health objectives are clearly important there may be a need to strike a balance between the need to attain health objectives and the impact of controls on the private sector. Interviewee 43 a non-exporting producer comments, for example:

> "*We've gone to meetings in Trinidad and Barbados and, and you can feel what they're [BAHA] doing is basically bragging that we're ahead of uh all the other countries right now and they make a big issue of that...and I feel like sure they, they, they pushed us ahead and, and maybe it is good but the industries are really suffering and they don't understand that*"[492].

Although comments identifying a negative impact of the framework on the private sector (Figure 6.23) reflect a concern that the framework as a whole has a detrimental impact, these comments often related to the issue of cost generally, rather than the appropriateness of the standard required. Only one stakeholder specifically identified too-high standards as a problem (Figure 6.20). It appears then that this is of much less concern to stakeholders than the overall finance issues, though of course the cost of compliance will often be influenced by the standard required.

Overall, there were very few problems related specifically to the requirements and influence of external sources of control. Private sector stakeholders appeared to be influenced as much by these sources of control as by domestic legislation and comply with the controls in order to gain access to importing countries. BAHA

[492] BAHA interview 43

plays an important role in enabling these stakeholders to achieve and maintain compliance and to access markets (through the provision of export documentation, for example) and therefore plays a positive role in facilitating agricultural exports. Some concerns remain over the balance that is currently being achieved between domestic health and trade objectives and the impact of this on the non-exporting private sector, though specific problems and concerns arise only in a minority of cases and are linked to other difficulties with the regulatory framework, particularly the issue of cost-recovery and provision of 'public-good' services.

6.3 SUMMARY OF STRENGTHS AND WEAKNESSES OF THE BELIZE AGRICULTURAL HEALTH FRAMEWORK

Strengths

- *Stakeholders are supportive of the need to pay a fee for use of agricultural health services*
- *Exporting private sector stakeholders, in particular, recognise benefits of regulation*
- *Involvement of third parties in assisting both BAHA and the private sector*
- *Influence of external sources of control beneficial to exporting private sector*

Weaknesses

- *Awareness of purpose of agricultural health regulation relatively low*
- *Impacts of cost-recovery concerning limitations on provision of services (particularly 'public good' services) and impact on private sector in terms of their perceptions and compliance burden*
- *Need for increased levels of stakeholder interaction between BAHA and the stakeholder community*
- *Identified difficulties/problems may be particularly acute for smaller-scale and/or non-exporting producers/processors*
- *Gaps in legislative framework, including problem of responsibility for food safety*
- *Problems associated with the degree to which BAHA does, and should, operate autonomously from its parent ministry*
- *Availability of resources*

Mixed messages

- *Several areas identified in both positive and negative terms including overall perceptions of the legislative framework and positive and negative*

perceptions of BAHA — indicates mixed experiences and uneven implementation and enforcement

- *Advantages and disadvantages associated with international agreements/sources of control*

Chapter 7: Evaluation and Conclusions

This chapter discusses the characteristics and limitations of the present study, as well as providing comparative discussion of the findings of the two studies and conclusions arising from these. The chapter begins with a summary of the development of the study. The two main evaluative sections follow this. The first is an evaluation of the methodology and the nature of the findings. The second is the identification of key influences on the implementation of national legal and regulatory frameworks for Biosecurity, based on the findings presented in Chapters 5 and 6, and how these might be relevant to other developing countries. Finally, some recommendations to the relevant regulatory agencies are made and possible avenues for future investigation are considered.

7.1 DEVELOPMENT OF THE STUDY

The present study sought to address an identified gap in research, namely the implementation of national Biosecurity frameworks. The research took place in the context of difficulties identified with the international legal framework, the existence of international standards affecting Biosecurity, the difficulties associated with implementation of national regulatory frameworks, including implementation of, and compliance with, international obligations and requirements and the particular issues facing developing countries. The study intended to consider how developing countries can achieve effective Biosecurity frameworks by investigating strengths and weaknesses in Biosecurity frameworks in Belize. In order to discover the factors affecting this success, a grounded theory approach was pursued. This approach was intended to enable relevant issues, as identified by stakeholders at all levels, to emerge. It was considered that this would enable a greater understanding of the factors influencing the success of these frameworks than would a purely legislative approach.

The findings are based on data collected through individual interviews. In total, ninety-four interviews were carried out (forty-seven for each study). The findings indicate that a broad range of influences have been important in affecting the success of the relevant frameworks. In each study there were findings which indicated the strengths and weaknesses of the framework but there were also other

influences that represented 'shades of grey' — influences which were beneficial in some respects but which presented challenges or limitations in others. These influences are not the same for both studies though there are issues which did emerge in both and which enable some comparative inferences to be drawn.

7.2 EVALUATION OF THE METHODOLOGY AND FINDINGS

7.2.1 Characteristics and limitations of the data analysis and findings

In presenting discussion and conclusions it is important to be mindful of the nature and limitations of the findings from which these are derived. The approach to data analysis was designed to enable effective and transparent analysis of the qualitative data derived from interviews. As has been seen, a mixed method approach was adopted with the aim of enabling the researcher to gain a detailed understanding of the issues arising in the data and to introduce some degree of objectivity in order to strengthen the internal validity of the analysis. It has been seen that recognised procedures and techniques were applied, with respect to both grounded theory and content analysis, with the aim of producing valid findings which were grounded in the data.

The obvious limitation of the adopted approach to data analysis is that it allows an element of subjectivity. One reason for this is that, as has been recognised, the analysis of qualitative data necessarily involves the interpretation of that data by the researcher.[493] Whether or not this is in fact a limitation is arguable. The 'presence' of the researcher in the analysis is, however, an accepted characteristic of grounded theory.[494] In the present case every effort was made to ensure that codes were applied consistently and this was facilitated by the constant comparative method in grounded theory as well as by the use of the codebook for

---

[493] See, for example, Flick, 2002, op cit. See Chapter 15. Creswell, (1998, op cit.) describes different forms of interpretation (p.145).

[494] The processes and characteristics of grounded theory research as described by Glaser and Strauss, (1967, op cit.) make this clear. See also Strauss and Corbin, 1998, op cit., pp.6 and 13; and Flick, 2002, op cit., Chapter 15.

content analysis (as described in Chapter 4). It is recognised, however, that the development of codes and the identification of issues in the original data will be influenced to some extent by the researcher's background and experience.[495] While the researcher is confident that the identification of issues for the present study is a 'true' reflection of those present in the interview data, that is not to say that another researcher, approaching the data from a different perspective or having a different background, might not identify other issues as being relevant.

One measure taken to strengthen further the 'validity' of the findings was the provision of reports on the findings to the relevant regulatory agencies. For each study the researcher provided a written report summarising the main findings and conclusions. In the case of the PCB, the report was written before content analysis had taken place and therefore reflected only the grounded theory analysis that had taken place thus far. In the case of the BAHA study the report incorporated the findings of both types of analysis. The PCB report was submitted in September 2004 and the BAHA report was submitted in June 2006. In each case the researcher invited comments and feedback on the reports and findings set out therein.[496] Following submission of the BAHA report, to the BAHA Board of Directors, the researcher received feedback from the Managing Director that the report had been given the "green light"[497]. The researcher engaged in informal discussions of the findings of the PCB study with the pesticides Registrar who did not question or contradict the findings or issues arising but did provide further examples of the approaches taken by the PCB (these are referred to in this chapter).

The findings ultimately represent stakeholder perceptions as identified, understood, and interpreted by the researcher. Clearly coding decisions made will, therefore, affect the eventual findings. As discussed, the researcher made efforts to ensure that coding was consistent. One issue in this respect is the possible

---

[495] See Flick, 2002, op cit. at pp.50–51 with respect to the issues of subjectivity and the role of the researcher as research instrument and analyst.
[496] As seen in Chapter 4, in the case of BAHA, a condition of access was that the researcher would report on feedback.
[497] Personal communication, 23 August 2006.

difference in the application of codes between the two studies (the PCB transcripts and the BAHA transcripts). It should be recognised that although the researcher followed the same approaches and procedures on both occasions, the data analysis for the second study was carried out much later than the analysis following the first study.[498] Since the data analysis was not undertaken in only one stage there could have been differences in the way that this part of the research was approached. It can be seen, for example, that in the case of the PCB, although generally responses were more positive and levels of awareness higher than for BAHA, in fact a greater number of problems were identified and were identified, on average, more frequently in the PCB study than in the BAHA study. This could be simply because there are more problems for the PCB than for BAHA. Alternatively, it might be that stakeholders are more engaged with the PCB than they are with BAHA and are therefore more aware of, and thus better able to comment on, these issues. It should also be recognised, however, that this result may be influenced by the application of codes by the researcher, for example the researcher might have classified instances as problems in the PCB study but not in the BAHA study. Before applying codes in the BAHA study, the researcher did review both the procedures that had been followed for the first study and the way in which codes had been applied. This helped to ensure that the application of codes in the second study was consistent but it could not eliminate entirely these possible differences. Other factors could also influence the application of codes. For example, the researcher might have been more engaged with the data in the first study than in the second (though the high number of codes and categories identified in the second study makes this seem less likely), or the analysis could have been affected by other factors such as 'coder fatigue'.[499]

A further characteristic of the approach taken to data analysis, and of the grounded theory methodology, is that not all codes and ideas are presented or pursued.[500] As discussed in earlier chapters, the purpose of grounded theory is to allow relevant

---

[498] In each case the fieldwork stage was followed by transcription of data and then by data analysis. The first phase of fieldwork was carried out in February–March 2004. The second phase of fieldwork was carried out in July–August 2005.
[499] See Neuendorf, 2002, op cit., p.145.
[500] This is a usual feature of qualitative research; see Creswell, 1998, op cit., pp.140–141.

issues and themes to emerge from the data, in order to move towards an overall theory explaining 'what is happening'. The present study did not aim to achieve a final theory focused on a single issue; as discussed, the identification of influences on the success of given frameworks was the objective. Nevertheless, even in this case, not all codes and ideas were pursued. In gaining an understanding of the data and the issues arising from it, the researcher, as has been discussed in Chapter 4, began with a 'micro' level analysis and moved toward the 'macro' level. This meant that in the early stages of analysis many codes were applied. Some of these occurred only once, throughout the whole set of interviews. These might still be relevant if eventually they were linked with other responses. In some cases, however, particular codes or lines of enquiry were eventually considered to be 'dead-ends' and were not pursued further. Such data was not included in the findings and further analysis. For example, with reference to pesticides, the researcher initially began coding 'perceptions of pesticides' with respect to the risk that stakeholders associated with pesticides. If stakeholders had displayed a lack of awareness of the purpose of regulating pesticides or of the risks associated with their use, this might have been an important category. It became clear, however, that this was not the case. The researcher did not, therefore, continue to apply the code or to pursue this issue further. In the present case, findings which contributed to the identification of relevant influences on the frameworks and to the understanding of when and why these occurred were included. Codes that were not included, though possibly of interest, did not, it is considered, result in a lack of development of this understanding.

7.2.2 Benefits and limitations of the methodology

Grounded theory was employed as a methodology which would enable unique insights into the issues arising in the regulatory frameworks studied to be gained. It was anticipated that the application of grounded theory would allow the strengths and weaknesses of these frameworks to emerge. This, it was suggested, would provide a greater understanding of how Biosecurity frameworks can be successfully implemented than a purely legislative analysis. In assessing the methodology it should, therefore, be considered whether the study objectives were achieved through the application of that methodology. The application and

limitations of specific grounded theory procedures for data collection and analysis have been discussed in earlier chapters and will not be repeated here.

It has been seen, in earlier chapters, that there was an identified need for research into national Biosecurity frameworks but that little had in fact been carried out. There was a large body of literature focusing on the problems arising, actually or potentially, from conflicts within the international trade and environment framework and these had in fact been associated directly with Biosecurity. The findings indicate that there were a number of relevant considerations associated with this international framework. These were, however, related primarily to the implementation burden associated with international standards and trade agreements, rather than to conflicts between MEAs and WTO Agreements. This is not to say that such conflicts do not exist. Indeed, one limitation of the study is that an investigation of the environmental protection authorities was not undertaken. This may have provided further insights into the implications of implementing MEAs. However, within the context of agricultural health and pesticides control, conflicts between international agreements were not seen to cause difficulties with national implementation. In fact, the relevance of MEAs, based on the perceptions and experiences of interviewed stakeholders, was relatively low.

A number of other issues were, however, identified as important. In the case of Belize, factors such as the approach to enforcement, the degree of interaction between the regulatory agency and regulated community, and the role of third parties, were all identified as important influences on national Biosecurity frameworks. It is considered that these findings therefore represent the issues that are most relevant, in practice, to the success of the frameworks studied. This, it is argued, is a direct result, and benefit, of the methodology adopted. Certain issues, such as the difficulties arising with respect to BAHA's mandate for food safety, might have been identified through an examination only of the legislation. The significance of these other influences, however, could only have been identified by a methodology focused on enabling the emergence of issues. A methodological

approach based on the pursuit of a given hypothesis or on other limitations on the boundaries of investigation (including the range of stakeholders involved) would, therefore, not have enabled the various significant issues discussed in the second part of this chapter, and in Chapters 5 and 6, to be identified.

One characteristic of the methodology, and the resulting findings, might be considered a limitation: in focusing on the emergence of issues, the depth with which these could be explored individually was limited. The purpose of the study was to identify the influences and factors which affected the success of Belize's Biosecurity frameworks. The 'trade-off' however, in pursuing this approach, was that no single issue could be explored to the fullest possible extent. For example, difficulties for Belize in participating at the international level are seen to be an important issue. Further examination of the extent to which this is a problem and the implications of this would have been helpful but was beyond the scope of the present study. Though such a detailed examination would have been illuminating, the exploration of issues as they emerged was the objective of the present study: hence this feature was not a limitation of the methodology but rather a known characteristic of it, which was deliberately built into the study design. Had the researcher wished to pursue a set hypothesis regarding a particular issue then a detailed investigation of that issue would have been necessary. In seeking to identify relevant issues, however, a focus on one particular issue would have necessitated that the exploration of others was neglected. This would have been contrary to the study aims and objectives.

The inclusion of a broad range of stakeholders was an important component of the adoption of grounded theory in the present study. Without this, the findings would certainly have been of more limited value. It can be seen that in some cases there were significant differences of opinion or perception between different stakeholder types. For example, disparities arose in the PCB study between the perceptions of Board members and of other stakeholders. Similarly, in the BAHA study there was, in particular, a difference between 'issues requiring attention' identified by BAHA compared with those identified by other stakeholders. These differences

were important in enabling a greater insight into the operation of these frameworks. It can be seen, for example, that interviewing only the regulatory agency and not those subject to regulation, would have produced different and therefore less representative and insightful findings. Similarly, the participation of a wide range of stakeholders facilitated a greater understanding of the circumstances in which third parties played a role than would have been revealed by interviewing only the agency or a more restricted set of stakeholder types. As has been noted, some stakeholders had to be excluded from the study due to time constraints. Banana farmers (for example) were not interviewed for the BAHA study. Nevertheless, it is submitted that a broad enough range of stakeholders were included in each study to allow the issues to be explored from a sufficient range of perspectives though it is admitted that the inclusion of some of these other stakeholders could only have benefited the study by contributing to the richness of the data.

It should also be remembered that because the methodology involved the inclusion of stakeholders, it led to findings which are based on stakeholder perceptions. This was an important characteristic of the study design. However, in some circumstances stakeholders may have commented on issues but may not in fact have been aware of the situation in reality. For example, stakeholders commenting on the level of financial and political support provided to BAHA by central government were unlikely to be aware of the actual extent to which such support is provided and to which it is sufficient for BAHA. Nevertheless, the identification of such perceptions, even if not a reflection of the situation in reality, is important. These perceptions may indicate that difficulties do exist but the identification of stakeholder perceptions is also important since these provide insights into other factors affecting the regulatory frameworks. For example, even if the issue of 'intervention', identified in the BAHA study, is not, in fact, a problem, the perception amongst stakeholders that it is a problem may indicate that these stakeholders hold negative feelings about the regulatory controls and may encourage non-compliance (as discussed in Chapter 6). The researcher did not attempt to ascertain, in the course of interviews, the extent to which stakeholder

perceptions reflected 'reality' in situations in which comments were made but were possibly not based on knowledge of the full facts (for example, with respect to the adequacy of funding). Indeed, it would not have been possible to ascertain this by the data collection methods adopted. It is suggested that the only way in which this could have been achieved would have been through the implementation of a much larger-scale, long term project which would have sought to validate stakeholder responses. This would have been in no way feasible within the constraints of a thesis investigation.

A further important characteristic of the grounded theory methodology is that it enables the researcher to strike a balance between micro analysis, which is so focused on a particular set of circumstances as to make it difficult to draw inferences about the potential wider application of the findings, and 'grand theories' which can be difficult to reconcile with practical settings. Although the findings in grounded theory, and in the present case, are based on interpretation and abstraction of the data, (the limitations of which have been discussed in the preceding section), they are also **grounded** in the data. It is considered that this results in potentially valuable findings because the essence of the different stakeholder perspectives is not lost (in the present study the researcher has sought to demonstrate this through the inclusion of illustrative quotations) but the analysis also enables broader insights to be achieved. These insights are presented in light of the full background to the study, the data analysis methods adopted, and the various findings derived from the data so that; (a) broader insights concerning the applicability of the findings to other settings can be made and (b) the availability of this background information enables the reader to consider whether, in fact, these inferences would be relevant to another particular setting.

Overall, the methodology has been important in identifying, in a single study, a range of issues influencing the success of Biosecurity frameworks. Empirical studies have been undertaken in the field of environmental and food safety regulation but these have often focused only on enforcement and compliance practices and motivations and often only involve a restricted range of

stakeholders.[501] [502] In Chapter 1 it was seen that difficulties with conflicting international agreements have been focused on in the field of trade and environment and that the associated implementation burden has also been identified as a difficulty. In the present case enforcement practices and compliance motivations were important aspects of the findings. Difficulties with conflicting international agreements were not seen to be causing problems but implementation difficulties were significant. Further, a range of other issues were important. The identification of issues that were relevant, and the exclusion of those that were not, was achieved through the application of a grounded theory approach to data collection and analysis and as an overall methodology. The findings arising from the application of grounded theory are grounded in the data but also offer insights into their potentially wider applicability. It is considered, overall, that this was an appropriate methodology for the investigation of national Biosecurity frameworks.

7.2.3 Is Belize a good model for the evaluation of national Biosecurity frameworks?

Since the present study intended to provide conclusions which may be more broadly applicable to developing countries that are implementing Biosecurity frameworks, the extent to which findings from Belize may be applicable to other developing countries should be considered. There are two issues to consider in this respect: firstly whether the methodology which, it has been argued, was successfully applied in Belize, could also be successfully applied in other developing countries; secondly, the extent to which the characteristics of Belize are similar to, or different from, other developing countries and the extent, therefore, that the findings might be applicable to developing countries more generally.

---

[501] See, for example, Hutter, Bridget. *The Reasonable Arm of the Law? The Law Enforcement Procedures of Environmental Health Officers*, Oxford Socio-Legal Studies, Oxford: Clarendon, 1988; Fairman, Robyn and Yapp, Charlotte, 'Enforced Self-regulation, Prescription, and Conceptions of Compliance within Small Businesses: The Impact of Enforcement', *Law and Policy*, vol. 27, no. 4, October 2005, pp.491–518; Abbot, Carolyn, 'The Regulatory Enforcement of Pollution Control Laws: The Australian Experience', *Journal of Environmental Law*, vol. 17, no 2, 2005, pp.161–180; May, Peter J., 'Compliance Motivations: Perspectives of Farmers, Homebuilders, and Marine Facilities', *Law and Policy*, vol. 27, no. 2, April 2005, pp.318–347.

[502] Also, often in these studies although the *methods* adopted have been made clear, the *methodological* approach has not. This means that various assumptions that would have informed the study, including the collection and analysis of data, have not been made clear.

In undertaking fieldwork, the researcher's work benefited in a number of ways from the choice of Belize as the project location. As discussed in Chapter 3, there were no serious difficulties with gaining access to the field for either study. This is perhaps a consequence of the fact that Belize does have a functioning participatory democracy and that access to Belize's public institutions is not tightly guarded or prohibited as it no doubt is in some developing countries. Similarly, the researcher had no problems securing interviews since participants were not afraid to contribute to the study even if this involved criticising the regulatory agency or the government.

The researcher also benefited from the relatively high levels of education and literacy that many stakeholders had. Generally there were no difficulties arising from the use of written tools, such as the 'permission to interview' sheet. Stakeholders were usually able to engage in the interview, having a good level of awareness of the various issues arising in Belize and of the relevant regulatory agencies. Again, the benefits of the methodology would have been restricted had the study taken place in a country in which levels of engagement were limited, so that stakeholders would not have been able to participate so actively. Difficulties with literacy levels, it is considered, could have been overcome through reliance on verbal explanations.

The small geographical size of Belize meant that the researcher was able to readily access all parts of the country and therefore to engage with a broad range of stakeholders. It is submitted that in undertaking the study in a larger country, access to different stakeholder types might have been more limited and that the study would probably have had to focus on a smaller range of stakeholder types. Similarly, the small population size also facilitated access to stakeholders. Most companies, NGOs and Government Departments have relatively small numbers of personnel and it is therefore easier to gain access to relatively senior stakeholders who are perhaps able to provide insights that, for example, more junior civil servants are not (though as discussed, stakeholders at all levels should be included to ensure that different perspectives are represented).

It can be seen that there were a number of features of Belize which enabled effective studies and that the researcher may have encountered greater limitations in some other developing countries. Certainly attempts to undertake such a study in a country without a functioning democracy would probably have been less fruitful. However, in cases in which stakeholders were less aware of the regulatory framework, the regulatory agency, and were less engaged with the relevant issues generally, these would still have provided useful data. A lack of awareness, and the reasons for it, is just as important and interesting as high levels of awareness. By identifying reasons for stakeholders, for example, not interacting with the regulatory agency, or not being aware of broader issues, important insights could have been made concerning the strengths and weaknesses of those frameworks.

With respect to the other characteristics it is considered that these would not have diminished the successful application of a grounded theory approach. The exclusion of relevant stakeholder types would be an important limitation but it would be only a limitation nonetheless and one that could be addressed through careful planning as well as a clear explanation in the research of this limitation. The involvement of a range of important stakeholders would still enable issues to emerge and these would still be worth pursuing even if they did not provide the same level of understanding as would be achieved through inclusion of a broader range of stakeholders. The research questions would have to be framed appropriately on this basis. The various grounded theory studies referred to in earlier chapters are often based on the examination of one particular stakeholder group, for the purpose of allowing a particular issue to be examined.[503]

Concerning the applicability of the findings to other developing countries, one important characteristic of Belize is that it has a relatively high literacy rate. This is not a characteristic of all developing nations. This level of literacy may have been an important influence on the success of some aspects of Belize's Biosecurity frameworks. For the PCB and, to a lesser degree, for BAHA, the provision of leaflets, posters and other written materials has been a feature of the approach

taken to public awareness activities. In an effort to reach as many stakeholders as possible, these materials have been provided in both Spanish and English. In the case of the PCB, the issuance of the certified user licence is based on the user taking a written test, following the workshop. For countries with more limited levels of literacy the use of educational activities adopted in Belize may not be as appropriate or as beneficial. This indicates an underlying need for good levels of literacy to enable stakeholders to engage with the regulatory agency and to facilitate awareness of regulations and methods for achieving compliance. On a more short-term basis, countries with lower literacy levels may need to adopt educational approaches that do not rely on written materials. For example, practical rather than written tests could potentially be used for certification purposes in the case of pesticide user licences. It is recognised, however, that such approaches are likely to be more resource-intensive than the use of written materials and may be difficult to implement in light of limited resource availability.

Belize, as mentioned, also has a functioning democracy. Although some issues concerning intervention and conflicting policies arose in the BAHA study, Biosecurity regulation in Belize seems to take place, for the most part, without undue interference. In some countries this may not be the case. Belize also appears to benefit from a participatory climate and generally some level of dialogue exists between the regulated community (and other stakeholders) and the agencies. Again, it is noted that not all countries will be subject to this type of regulatory environment. This environment appears to have been an important influence within Belize's Biosecurity frameworks. For example, it has been seen that the level of interaction between the regulated agency and the regulated community, as well as the informal nature of that contact, has been beneficial in the pesticides control framework. In both studies these approaches were supported and encouraged.

---

[503] The application of grounded theory in law has, however, been based on the inclusion of a range of stakeholders. See Chapter 2.

A further characteristic of Belize and of its Biosecurity frameworks is that the population is small. This applies to the population of the country as a whole, and consequently to the population size of the regulated community. This has both advantages and disadvantages. One benefit for the regulatory agency, which may not exist for countries with a very large population, is that the regulated agency has relatively easy access to the whole of the regulated community. In any given sector, particularly those involving larger scale production, such as aquaculture, the number of agricultural producers and processors will be limited. Because of this, it is relatively easy for the agency to maintain an awareness of developments within those sectors. It also means that, in terms of undertaking training and similar activities, it may be relatively easy to target stakeholders. In countries with larger populations, it may be more difficult for the regulatory agencies to communicate with the regulated community and wider stakeholder population. It has been seen that in the case of BAHA there was some scope to improve awareness of the role of the agency and purpose of the regulatory framework and that there was a lack of a consistent view in this respect. If such difficulties exist in Belize, they are likely to present an even greater challenge to countries with much larger populations. The small population size also presents challenges, however. In terms of pesticides control, for example, difficulties have occurred that may not have done for larger countries, namely access to pesticides and requirements for information on pesticides have been restricted on occasion because the pesticide producers do not consider Belize to be a significant enough market, for example to pay to register new pesticides. The relatively small-scale level of production is also a difficulty for exporters because of the associated cost of production, which may be lower in countries where production takes place on a much larger scale.

It is also relevant that the main regulated group in Belize is small-scale farmers. In many developing countries this will also be the case. The difficulties experienced by these stakeholders, particularly with relation to the cost of compliance may therefore be more widely applicable. Other findings related to the regulation of these small-scale farmers will also be applicable. For example, it has been seen that small-scale producers who are not exporters may lack the 'external'

enforcement and compliance mechanisms, including assistance from certain third parties, available to exporters.

Perhaps the characteristic that Belize shares most with other developing countries is that it has severely limited resources. Belize suffers from limited resources in overall terms and specifically related to Biosecurity frameworks. This means that as well as financial resources, human and technical resources are also very limited. These difficulties are likely to be experienced by many other developing countries, sometimes to an even greater extent. For those countries the difficulties identified with Belize's frameworks, which are often linked directly or indirectly with resource availability, are likely to be applicable.

7.3 COMPARATIVE DISCUSSION AND CONCLUSIONS

7.3.1 The international framework for Biosecurity: influences and impacts

It has been seen that the international legal framework is clearly a significant influence on agricultural health in Belize. An important finding in the case of BAHA concerns the low level of identification of international environmental agreements. This suggests that environmental decision-making is limited in the present agricultural health framework. Issues related to international environmental agreements are presumably dealt with by other bodies such as the Department of Environment. It might be considered that this could cause problems, particularly related to the implementation of the CBD. In fact no such difficulties were identified. Issues related to the interaction between trade and environmental agreements were, therefore, not perceived to be important. It can be seen that this finding is significant since although a huge volume of literature has addressed the trade-environment debates, at the ground level, in this particular instance, this is not an important influence on Biosecurity in Belize. Several other issues and influences, discussed in this section, were substantially more significant on this occasion.

Awareness of international standards was, however, particularly high, with the majority of stakeholders referring to at least one international standard or the relevant standard-making body. Identification of WTO Agreements was also relatively high. The influence of these agreements and standards has permeated the agricultural health framework in a number of ways. International standards have been incorporated into domestic legislation. For example, the Food Safety Regulations require exporting food processors to implement a HACCP system. The guideline provided in the regulation is based on the relevant Codex guidelines. This also applies to exporting processors in the fisheries and aquaculture sector. In some cases, however, awareness of these standards, primarily of HACCP, is not directly associated with domestic controls. Such standards were on some occasions identified simply as international requirements. On other occasions compliance was identified as a requirement of importing authorities and stakeholders commented that particular practices were followed for this reason. This indicates that the requirements and standards adopted by importing authorities may be as significant as local requirements (or even more so) for exporting producers and processors.

The findings also indicate that international standards and the requirements of importing authorities are perceived by stakeholders to bring both benefits and challenges. Belize has been able to realise the benefits of increased market access arising from the adoption of, and compliance with, these standards and regulations. The implementation of HACCP and of EU requirements into domestic fisheries regulations, for example, has facilitated an export market for this sector. The existence of pest free areas was also perceived positively by the few stakeholders who commented on them and has been linked to market access for commodities such as papaya. It is clear, however, that participation and compliance difficulties remain and that, while international standards and importer requirements were not usually perceived wholly negatively, there were identified problems. These particularly concerned the financial burden that compliance places on both the private sector and the regulatory agency. In this respect, Belize is sometimes still not able to realise fully the potential benefits afforded by

harmonised, international standards because, in some circumstances, implementation is a burden rather than, or at least as well as, a benefit. The difficulties associated with the 'implementation burden' for developing countries were discussed in Chapter 1 and the findings indicate that this burden clearly is relevant and continues to be a problem for developing countries such as Belize (see Chapter 6).

It is important that developing countries are aware of the various influences arising from the international framework for Biosecurity. The importance of market access and of the requirements of importing countries and involvement of importing authorities may alter the role played by the domestic regulatory agency. Traditionally, in circumstances in which regulation was independent of such influences, the domestic framework is the source of controls and regulations and the domestic agency is the enforcer of those regulations. In Biosecurity frameworks, however, enforcement may also come from other (importing) authorities. The domestic regulations will themselves often be based on internationally, rather than domestically, agreed standards and requirements. The role of the domestic regulatory agency is partly to enforce the Biosecurity regulations of other countries (i.e. by ensuring that exported goods meet the requirements of importing authorities). The authorities of a trading partner thus play a role in ensuring that local Biosecurity objectives are met. An important consideration in this respect is the burden imposed on exporters by countries, such as those in the EU, who may adopt standards that are stricter than international standards. These will be implemented for the purpose of achieving local Biosecurity objectives but in fact will increase the burden on the private sector and the regulatory agency in the exporting country. This possibly also relates to the need to ensure clarity with respect to the trade-environment issues discussed in Chapter 1. This is not only so that countries can adopt confidently Biosecurity measures but also so that exporting authorities have a clearer understanding of the types of measures that can be legitimately imposed and those that cannot. As has been discussed, in developing countries the resources available to both the private sector and the regulatory agency, to achieve compliance, will often already be

limited. It is important that domestic authorities are mindful of the potential imbalance that could arise in this context. As discussed in Chapter 6, there will be a need to ensure that domestic producers who are not involved in this international regulatory framework are, nevertheless, successfully regulated and that non-export related Biosecurity objectives are met. In this case the domestic agency/agencies will usually be the only relevant agency.

All of the relevant international frameworks envisage, and indeed require, that member countries will play a role in the development of international standards and other international measures and agreements (see Chapter 1). The significance of these standards within the BAHA framework indicates the importance of such participation, since these standards have been adopted and clearly have an impact. As discussed in Chapter 6, the ability to participate at the international level is important for the purpose of ensuring that Belize's interests are taken into account and to attempt to avoid or address some of the implementation and compliance difficulties that it faces (and similarly for other countries). The findings indicate, however, that Belize (and BAHA) has not necessarily been able to participate in a meaningful way i.e. beyond mere attendance. Even this may be limited as was suggested in the case of BAHA. This is a finding that is likely to reflect difficulties for many developing countries dealing with similar limitations to Belize. The difficulties with, and the need for, participation have long been discussed. Asoke Mukerji notes that following the first triennial review of the operation of the TBT Agreement, in 1997, a "*major concern expressed by developing countries was that they were not able to play a full part in the preparation by appropriate international standardizing bodies of international standards*"[504]. Mukerji also notes that "*a major challenge facing developing countries in this respect is the need to create the necessary domestic infrastructure to deal with the proliferation of national and international standards and measures*"[505].[506] Graham Mayeda notes, however, that the costs of improving the

---

[504] Mukerji, Asoke, 'Developing Countries and the WTO: Issues of Implementation', *Journal of World Trade*, vol. 34 no. 6, 2000, pp.33–74. p.49.
[505] Mukerji, 2000, ibid., pp.50–51.
[506] Michalopoulos discusses the limited participation of developing countries in the WTO itself, in terms of representation in Geneva, and also notes that the effectiveness of this participation

capacity of developing countries to participate can be considerable.[507] In the present case it appears that the necessary infrastructure and capacity is limited. This is primarily because of a lack of resources and is therefore likely to be applicable to many developing countries.

The findings of the present study indicate that difficulties with international participation are relevant to Belize and that the need for developing countries to participate effectively has still not been successfully addressed. In this context the issue of assistance and 'capacity-building' is important. It is recognised that external assistance is needed to assist developing countries in developing the capacity and infrastructure to implement international rules and standards and to participate in their development.[508] In the present case regional bodies in particular play an important role in providing assistance to enable participation (see below). It is important therefore, that such assistance is provided to developing countries wherever possible and that countries utilise the assistance that is available.

7.3.2 Legislation

The findings of both studies reflect the need for legislative frameworks to be up-to-date and to reflect current regulatory priorities. Although there are a number of other influences on the success of Biosecurity frameworks the sufficiency of legislative provisions is clearly also important.

In the case of the PCB, the legislative provisions were generally well supported with few problems associated with the existing provisions. The pesticides control

---

depends on the ability of developing countries to develop adequate infrastructural capacity. See Michalopoulos, Constantine, 'The Developing Countries in the WTO', *The World Economy*, vol. 22 issue 1, January 1999, pp. 117–143. See also Blackhurst, Richard, Lyakurwa, Bill and Oyejide, Ademola, 'Options for Improving Africa's Participation in the WTO', *The World Economy*, vol. 23 issue 4, 2000, pp.491–510; Sawhney, Aparna, 'Quality Measures in Food Trade: The Indian Experience', *The World Economy*, vol. 28, issue 3, March 2005, pp.329–348.

[507] Mayeda, Graham, 'Developing Disharmony? The SPS and TBT Agreements and the Impact of Harmonization on Developing Countries', *Journal of International Economic Law*, vol. 7, no. 4, 2004, pp.737–764. With respect to the cost of compliance with international and importer standards see also Schillhorn van Veen, 'International trade and food safety in developing countries', *Food Control*, vol. 16, no. 6, 2005, pp.491–496. Schillhorn notes that the costs of implementing food safety rules will be particularly difficult for small-scale producers and can exclude these producers and therefore limit rural growth. This is also discussed by Sawhey, 2005, op cit.

framework has perhaps benefited in this respect from having been subject to several revisions, including amendments of the primary legislation as well as the introduction of regulations at various stages. Even in light of this, there were difficulties associated with regulatory gaps. In some areas of control (such as aerial application), recommendations and legal authority had been provided for the adoption of Codes of Practice but these were yet to be adopted. Similarly, perceptions of the legislative framework for agricultural health indicated that some stakeholders consider the current provisions to be inadequate. Despite having received various recommendations for revision of the legislative framework these had yet to be adopted or other alternative amendments made. This meant that BAHA has been unable to introduce measures in some areas which were seen as a priority, (for example, a certification programme for citrus budwood). These weaknesses exist, in the case of the PCB and BAHA, in frameworks which are relatively new or which have been subject to relatively frequent revision. In many developing countries legislative frameworks will not be as up to date and the problems identified in Belize might therefore be more acute for those countries.[509]

These legislative gaps can weaken the regulatory framework. As discussed in Chapter 5, recommended practices might be adopted by the regulatory community despite a lack of formal legislative authority. However, this will be based on voluntary compliance only and might not be sufficient to achieve effective levels of regulation because it leaves the agency without recourse to enforcement in cases in which these practices are not followed. It has been seen that in the PCB study there was an identified need for increased levels of enforcement and that there were a number of identified problems associated with non-compliance (which might be related more directly to a lack of enforcement than to legislative gaps *per se*). It might, therefore, be considered that such a voluntary approach is

---

[508] See, for example, Schillhorn, 2005, op cit.

[509] For example, problems with respect to the inappropriate use of secondary legislation have also been seen in Tanzania. In that case the Plant Protection Regulations 1998 attempted to address inadequacies in the Plant Health Act 1997 with respect to the designation of a competent authority. Similarly, the regulations designated a Registrar with authority for registration of pesticides but this post was not properly designated under the primary Act. (See Plant Protection Act 1997, s.30 and Plant Protection Regulations 1998, regulation 8). Other deficiencies in the relevant legislation, such as conflicting or non-existent definitions, were also evident.

not sufficient and that requirements must be backed up by appropriate legal authority. In the case of BAHA, in which some controls, such as those for exporting producers/processors, might be viewed as more prescriptive and thus less reliant on informal, co-operative relationships as a motivator for compliance, problems associated with non-compliance were fewer but nevertheless were identified. A further problem, identified in the BAHA study, is that the implementation and enforcement of controls for which there is no legal mandate further weakens the regulatory framework because it leaves measures open to challenge. This potentially applies both to the subjects of the 'regulation' and to countries which trade with Belize and could initiate a dispute within, for example, the IPPC or at the WTO. One member of BAHA staff did express concern that such a dispute might only be a matter of time (see Chapter 6).

The need for strong legislative frameworks also arises with respect to the powers and authority of the regulator. In the case of the PCB this does not appear to have been a problem. The PCB does have authority, under its primary legislation, to undertake all of the activities with which it is currently involved and, importantly, this responsibility is not shared or duplicated by any other agencies.[510] It has been seen however, that this has not been the experience of BAHA. The overlaps and conflicts over the regulation of food safety by both BAHA and Public Health clearly stem from the fact that BAHA does not have clear legal authority for the regulation of food safety, within the BAHA Act. It is unsurprising that Public Health have been unwilling to give up the regulation of food safety where they perceive that Public Health has a legitimate mandate for this and BAHA does not. It is clear that the primary legislation must provide the relevant mandate to the regulatory agency in order to avoid such conflicts and the associated problems discussed in Chapter 6.

To ensure that provisions are not *ultra vires* it is also important that there is a proper understanding of the difference between different types of legislation (i.e. primary and secondary). It has been seen that in agricultural health, secondary

legislation has sometimes been relied upon to provide regulatory authority or to address legislative gaps. This again can cause problems. For example, in addressing BAHA's lack of primary authority for food safety, regulations were introduced stating that BAHA has this authority. Clearly this does not provide BAHA with adequate legal authority. Nor is it appropriate to use very general powers to make regulation as the basis for the introduction of specific regulations. There should be clear authority to introduce such regulations in relevant parts of the primary legislation, otherwise a person wishing to challenge these regulations might, for example, argue that they go beyond the intention of the primary legislation and, therefore, lack legal authority.

The difficulties with the legislative provisions for each agency (discussed in more detail in Chapters 5 and 6) seem to reflect difficulties with legislative 'bottlenecks' and an inadequate system for the timely amendment of legislative frameworks, including both the primary and secondary legislation.[511] Though amendment of primary legislation is, of course, a lengthy process, in the case of BAHA there are a number of very important gaps in the primary legislation and there have been recommendations concerning the need to address these.[512] Nevertheless, these have still not been addressed. Previous amendments of the Pesticide Control Act have also been slow, sometimes taking several years for necessary changes to be introduced. Such difficulties will be present in many developing countries because of the lack of availability of adequate technical legal expertise and generally low levels of personnel to identify and address problems. The situation has been the same concerning secondary legislation for both authorities. In the case of BAHA a number of recommendations for new regulations and changes to existing regulations had been made but these have also not been adopted. As discussed above, there is an outstanding need for the adoption of Codes of Practice or appropriate alternative measures to address regulatory gaps for pesticides control.

---

[510] BAHA do have a mandate with respect to the undertaking of analyses for pesticide residues but this is complementary to, rather than conflicting with, the PCBs operations.
[511] These difficulties are also discussed by Black, 1999, op cit.
[512] See Chapters 2 and 6

In the field of Biosecurity, the need to ensure that updates and amendments can be made is particularly important. This is because international standards are introduced with relative frequency and because the risks from pests and diseases may also change (so that Orders listing regulated pests, for example, will need to be updated accordingly). Where the infrastructure and resources are not available to do this countries may face restricted trade access or increased risks to human, animal, or plant health because legislative provision is inadequate.

7.3.3 Stakeholder interaction

The findings in both studies indicate that the type and degree of interaction which takes place between the regulatory agency and the regulated community (and also other stakeholders), is an important influence on the regulatory framework. This interaction affects both stakeholders' levels of awareness of the purpose of regulations and their levels of support for those regulations.

In both studies there was a perceived need to increase levels of interaction. In the case of BAHA, there was a strongly identified need to increase levels of interaction generally and to increase stakeholder sensitisation in particular. In the case of the PCB there was a perceived need to increase both the scope and frequency of activities, including training and education activities. This identified need can be interpreted differently in each case. In the case of the PCB there were high levels of support (for example, high numbers of positive perceptions) and a high level of awareness of the purposes of pesticides control. Private sector stakeholders reported, in the large majority of cases, that they had been involved with education and/or training in some capacity. Problems and negative perceptions did not relate to a lack of such activity. For these reasons it seems that there is no problem in terms of the PCB failing to undertake training and education or a lack of those activities. The perceived need for an increase in the frequency and scope of activities, including education and training as well as farm 'visits', can therefore be seen as a positive reflection of the PCB's approach; the need for the increase is because of the apparent success of these activities and the benefits derived by stakeholders. For these reasons stakeholders wish to see more of them. In the context of BAHA, on the other hand, stakeholders have mixed

experiences of the framework and the identification of the purposes of regulation is less consistent than for the PCB. The few perceptions of stakeholder education/participation in positive terms are countered by negative perceptions focusing on a perceived lack of such interaction. In this context the perceived need for increased contact between BAHA and its stakeholders reflects the perception that the levels of this type of activity have been insufficient.

The findings suggest that an educational approach is effective in gaining high levels of awareness and support for regulations. The educational approach adopted by the PCB has been demonstrated to be a strength of that framework and a lack of such activity may have been limiting in the case of BAHA. The findings of both studies indicate that it is not only general education and awareness raising that is important but also that there is a certain type of interaction between the regulator and the regulated community. In the case of the PCB the high levels of informal interaction and the positive relationships existing between pesticide users and PCB technicians were identified as positive aspects of the regulatory approach.[513] In the case of BAHA the use of participatory approaches such as 'user groups' was perceived, in a few cases, to be positive but lacking. The importance of this inclusive and participatory approach is also recognised by Gongora, who notes that the involvement of a broad range of stakeholders in user group meetings provides opportunities to discuss the provision of services by BAHA and that when cost-recovery is discussed with user-groups the ensuing programmes are well supported.[514]

It should be remembered that the PCB is older than BAHA, which has been in existence for only six years, and that it is perhaps unsurprising that levels of awareness are higher with respect to pesticides control than for agricultural health.

---

[513] The importance of the role played by inspectors (technicians) has been discussed in Chapter 6. Fairman and Yapp also discuss the importance of the inspectors' role noting that in their study interviewed stakeholders' conception of compliance was a result of their contact and negotiations with the inspectors rather than knowledge of the actual legal requirements. In that study, overall levels of knowledge of legal requirements were low but were higher where regulatory agencies adopted an educational approach. See Fairman and Yapp, 2005, op cit.

[514] Gongora. V., 'Veterinary Services in Belize: adapting organisational models to the needs of small economies', *Rev. Sci. Tech. Off. Int. Epiz.*, vol. 22 no.2, 2003, pp.463–471.

Nevertheless, the perceptions and experiences of interviewed stakeholders suggest that adopting an educational and informal approach, particularly with a high degree of interaction between the regulated agency (the officers or technicians) and the regulated community can produce positive benefits. This is not to say, however, that such an approach can be directly associated with increased levels of compliance. It is not possible, based on the findings of the present study, to determine whether or not compliance levels have been affected by the presence or absence of an educational approach. It might be assumed that the educational approach would have some positive impact on compliance, by increasing the ability and willingness of regulated stakeholders to comply (as discussed in Chapter 5). Robyn Fairman and Charlotte Yapp found, in their study of compliance of SMEs with UK food safety requirements, that in cases in which a predominantly educational approach was adopted by the regulatory agency, levels of compliance were "significantly better" than in cases in which the regulatory agency adopted a formal, enforcement-based role.[515] Fairman and Yapp's findings highlight benefits of an educational approach which have also been identified in the PCB study: increasing the knowledge of the regulatee and increasing the ability of regulated stakeholders (in that case SMEs) to determine their own compliance and reducing the complexity of some requirements.[516] [517]

It can be seen, however, that in the present case problems were identified for both frameworks. In the case of the PCB in particular, these included problems which had been identified some time ago and which, it therefore appears, may not yet have been successfully addressed. It can also be seen that the number of problems identified in the PCB study was higher than the number of problems identified in the BAHA study and that the frequency with which particular problems were identified was usually higher for the PCB than for BAHA. As identified in section

---

[515] Fairman and Yapp, 2005, op cit. See p.508.

[516] See Fairman and Yapp, 2005, ibid. Their study also found that in instances in which regulatees did not understand the requirements they often ignored them (p.505).

[517] May also notes that awareness of rules and how to comply with them are fundamental aspects of the capacity of regulated entities to take action [towards compliance], "*The presumption is that those entities with greater awareness of rules will have a stronger sense of civic duty to comply, because they are likely to be more aware of the reasons for the rules*" (though increased awareness may also foster objections to them for being unreasonable). See May, 2005, op cit., p.322.

7.2.1 there are a number of possible reasons for this being so. However, it can be seen that despite the otherwise positive perceptions, problems related to non-compliance were identified in the PCB study and that these might not have been sufficiently addressed by the adoption of the approaches described. Although an educational and interactive approach to implementation should facilitate a greater ability and willingness of stakeholders to comply, the adoption of this approach to the exclusion of others, such as more deterrent-based enforcement approaches, may not be sufficient to tackle some problems. Indeed, in his highly acclaimed work on responsive regulation, Professor John Braithwaite considers that 'responsive' approaches, involving both 'persuasion' (taken to include education) and 'punishment' (the application of formal sanctions) are most effective. Braithwaite comments that "*both consistent punishment and consistent persuasion are foolish strategies*"[518]. Nevertheless, as has been seen the adoption of educational and co-operative approaches is likely to be beneficial and may facilitate improved compliance levels. As has been discussed, Belize has a low population size and this means that access to the regulated community may be easier than in countries with high populations but in which the size and/or resources available to the regulatory agency are limited.

7.3.4 Enforcement

Despite the benefits associated with the educational and co-operative approach adopted by the PCB, the findings suggest that there may be limitations arising from the application of this approach to enforcement to the exclusion of other approaches and that there is in fact a need for some element of deterrence-based action in this respect. It has been seen that although levels of awareness and positive perceptions were higher for the PCB than for BAHA, the identification of problems was also more frequent.[519] The issue of enforcement arises primarily with respect to the findings of the PCB study and was not one of the main themes arising in the BAHA study.

---

[518] Braithwaite, John, 'Rewards and Regulation', *Journal of Law and Society*, vol. 29, no. 1, March 2002, pp.12–26. p.19. See also Ayres, Ian and Braithwaite, John, *Responsive Regulation: Transcending the Deregulation Debate*, Oxford Socio-Legal Studies, Oxford: OUP, 1992.

As discussed, the informal approach adopted by the PCB appears to have been beneficial in several respects and this does apply to some extent to enforcement because of the importance that positive working relationships between the regulator and regulatee may have in facilitating compliance. Fairman and Yapp found that the use of educational approaches was beneficial in self-regulatory food safety systems. Such systems are characteristic of those applied to some agricultural sectors by BAHA and this further suggests that educational approaches would be beneficial to the agricultural health framework.[520] Similarly, Peter May found that Danish farmers who were rarely subject to formal enforcement action had a strong sense of 'civic duty to comply' and low 'deterrence fears'. For boatyard operators the converse was true.[521] It has also been noted that the educational approach (through the use of workshops) and the co-operative approach between the PCB and stakeholders, including workshop attendees, has facilitated improved use of resources with respect to enforcement. This is because pesticide users who have attended workshops tend to be, consequently, highly supportive of the need to regulate pesticide use, including through compliance with approved user practices. Subsequently, in situations in which these stakeholders observe non-compliance they may report it to the PCB. This means that the PCB can often address specific instances of non-compliance rather than adopting larger scale routine inspections that would be limited because of the very limited manpower that the agency has.[522] This approach may have some value for other developing countries facing similar limitations. Although the provision of workshops and user training requires a certain input in terms of resources, this might be considered in light of that which would be required if resources were focused on remedial rather than preventative action. In the case of

---

[519] Though, as has been discussed, this finding may also be a consequence of various other factors. See section 7.2.1

[520] These are the 'enforced self-regulation' frameworks under which the regulatee adopts broad measures, objectives or guidelines which are then enforced by the regulatory agency. This is the case, for example where the producer is required to adopt HACCP systems and the adequacy and maintenance of these are then enforced by the regulatory agency. This was the case in Fairman and Yapp's study and also applies to the exporting aquaculture and, to some extent, to the livestock sector, in Belize (see Fairman and Yapp, 2005, op cit.)

[521] See May, 2005, op cit., p.329.

[522] This was reported to be the case by the Pesticides Registrar (personal communication, May 2006).

the PCB it has been considered that fewer resources are needed for the former approach.[523]

As noted however, this approach does have its limitations. As seen in Chapters 2 and 5, issues such as intoxication have been, and continue to be, a concern with respect to pesticide control. There was also, in the case of the PCB, a perceived need for increased levels of enforcement. It was suggested in Chapter 5 that this related partly to a lack of distinction between enforcement and other activities such as general advice. This may have contributed to perceptions that enforcement was not being carried out in some instances. It appears that on some occasions there may be a need for more 'formal' enforcement action and that such action might be necessary to increase and maintain the success of Biosecurity frameworks. This is not to suggest that sanctions such as the imposition of fines, revocation of licences, or even criminal sanctions, will be appropriate in all (or many) circumstances. A key feature of Biosecurity frameworks, and one which distinguishes them from many other frameworks, is that there is a wide range of regulated stakeholders. These will, in some instances, be larger businesses (such as the agro-chemical companies) and producers. More commonly, these will be small-scale or 'backyard' producers as well as individual members of the public, for example those bringing goods for personal consumption across the border from neighbouring countries, legally or otherwise. This is particularly so in countries like Belize where such activity is relatively easy and common. For these stakeholders, the imposition of excessive penalties may have severe economic consequences and, in turn, the impact of such penalties may be detrimental to agricultural productivity without necessarily ensuring future compliance. The need to 'send a message' to other stakeholders through deterrence-based action must, therefore, be weighed against the implications, particularly financial, for the subject of the action and the regulatory agency who will incur the cost of pursuing such action.

---

[523] Pesticides Registrar, personal communication, ibid.

The model of enforcement presently adopted by the PCB might be considered to be primarily 'compliance-based' as opposed to 'deterrence-based'. The existence of any definitive enforcement strategy is limited. In seeking to move beyond the simple distinction between compliance and deterrence approaches, Ian Ayres and John Braithwaite discuss the concept of 'responsive regulation' and in this context they identify an 'enforcement pyramid'. This pyramid has, at the base, actions based on 'persuasion' and moves upwards towards progressively more punitive action. The assumption is that enforcement approaches should be based, initially, at the base of the pyramid and move upwards, "*Then escalate to somewhat punitive approaches only reluctantly and only when dialogue fails and then escalate to even more punitive approaches only when the more modest forms of punishment fail*"[524]. This model seems to fit well with the enforcement needs of the PCB (and therefore agencies with similar characteristics and approaches) as discussed above and is based on the need to maintain positive relationships and only to apply more formal actions where this co-operative approach is exploited by the regulatee. In adopting alternative approaches to enforcement in the case of the PCB these may be based, for example, merely on increasing the formality of enforcement, in order to introduce a distinction between advice-giving and enforcement. For example, there could be a distinction between informal 'visits' and 'inspections', the latter approach being adopted occasionally. In this case, the only practical difference might be that the technician brings a check-list of requirements and provides feedback to the user where there are improvements to be made (i.e. instances of non-compliance). Enforcement might only be applied after advice has been given on at least one occasion but the regulatee has still failed to adopt the necessary changes. In such situations the enforcement action might, initially, be no more than a formal notification of the changes that need to be made. The severity of enforcement would, on this basis, increase gradually and only as regulatees failed to become compliant. Although the 'enforcement pyramid' arose out of studies on Western regulatory agencies, it can be seen that the principles might also be successfully applied to developing countries. In the case of the PCB the pyramid enables the successful aspects of the framework to

[524] Braithwaite, 2002, op cit. at p.20. The regulatory pyramid is presented in Ayres and

continue and only introduces other measures where these fail. This means that for most small farmers such measures might rarely be used but in cases of serious and blatant non-compliance an appropriate formal measure would be imposed, on the assumption that in that instance the persuasive approach has failed.

In the broader field of agricultural health, there may be other enforcement influences. As has been discussed, exporting producers may be subject to enforcement through inspections and audits not only by the domestic agency but also by importing authorities.[525] The need to maintain access to export markets may also be a powerful incentive to compliance even where levels of formal enforcement are low. Despite the identified need for education, exporting private sector stakeholders generally held positive perceptions of BAHA and several considered the measures and controls in place to be beneficial. For these stakeholders, the need for education from BAHA may be less important since they are subject to various other sources of control and because the consequences of non-compliance i.e. loss of market access, are relatively severe. However, for non-exporting stakeholders, including importers, these considerations will not usually apply. For example, persons undertaking importation may not be aware of the importance of their actions in terms of Biosecurity where they have not been subject to education. Similarly, the personal consequences of non-compliance will be limited where there is a lack of enforcement of, for example, controls on the importation of fruits and vegetables for personal consumption. For these stakeholders there may again be a need for the provision of education and a 'responsive' approach to enforcement. It is recognised, therefore, that the enforcement needs of exporting producers and non-exporting producers may differ. Of course, agencies will still be restricted as to the activities they can undertake in this respect because of small numbers of personnel. In the case of the PCB, it has been seen that difficulties related to enforcement might also have arisen because of the dual-role played by the pesticide control technicians, who act

---

Braithwaite, 1992, op cit., Chapter 2.

[525] This might also be relevant to pesticides control (though it did not emerge as a significant issue in the PCB study), for example in the banana sector the external buyers (companies such as Fyffes) may send in their own auditors to check pesticides use.

both as informal educator and advisor and as enforcer. As seen in Chapter 5, this may make it difficult for the technicians to adopt distinct approaches.

Finally, the 'visibility' and consistency of enforcement practices may be important. In both studies negative perceptions were identified in instances in which stakeholders felt that enforcement was not being carried out consistently i.e. that enforcement was applied to some stakeholders but not to others, or it appeared to stakeholders that appropriate enforcement action was not being taken. As suggested above, this may be of greater concern in instances in which only informal action is taken since stakeholders may perceive that in fact nothing has been done, or that the breach has not been taken seriously by the regulatory agency. This again suggests a need for some use of formal sanctions. Consistency is also important in this respect. It comes as no surprise that it is important to stakeholders to feel that enforcement is carried out in all relevant cases. A lack of visibility and consistency in enforcement may lead to reduced levels of support and may serve as an incentive to non-compliance (see Chapter 5 and 6).[526]

7.3.5 Resources

In Belize, as in most developing countries, regulatory agencies face limitations on the availability of resources. It is, of course, important that these resources are targeted as effectively as possible. The findings suggest that the utilisation of resources for public awareness and education activities is supported by stakeholders and will produce benefits but that there is also a need for other activities, including inspection, monitoring and enforcement activities, to be undertaken. In cases in which these are required by importing authorities, the authorities of exporting countries may be restricted, to some extent, in determining how resources are to be applied. Developing countries may also face difficulties where the availability of public funds is continually reduced (as was the case for the PCB and is the case for BAHA).

---

[526] The competence of inspectors may be relevant in this respect; May notes that "*perceptions of competent inspectors are expected to enhance sense of civic duty to comply*". See May, 2005, op cit., pp.321–322.

One approach to tackling the issue of sustainability and the effective use of resources is for agencies to operate on a cost-recovery basis. Both the PCB and BAHA operate on this basis. In some respects this has been beneficial for both BAHA and the PCB. It has been seen that the implementation of activities on a cost recovery basis has been associated, at least theoretically, with reduced difficulties associated with government bureaucracy and with greater independence and sustainability for the regulatory agency.[527] With respect to BAHA, Gongora comments that by operating on this basis, "*BAHA can conduct innovative cost-recovery programmes and... initiate staff motivation strategies without the drawbacks and delays of government bureaucracy*"[528]. No difficulties were identified with respect to the imposition of charges in relation to the PCB. In the case of BAHA it has been seen that the private sector appears to support the payment of fees for services in principle and in some cases BAHA appears to have been operating on this basis with success.

The adoption of cost-recovery systems or privatisation of agricultural health services is relevant to developing countries generally as such systems are, as in the case of BAHA, suggested as beneficial alternatives to wholly public funded systems, in light of limited resources.[529] The impacts and factors affecting the success of such systems should therefore be considered. The findings indicate that there are a number of difficulties associated with the operation of cost-recovery for agricultural health services in Belize (by BAHA). It has been seen that in the case of BAHA the availability of services was perceived as a weakness by a small number of stakeholders. The FAO has noted that the consistent availability of services is one condition affecting the willingness of producers to pay for services.[530] A further limitation is that services and activities which are less easily cost-recoverable may not have been implemented to the extent desired by

---

[527] See IDB, 1999, op cit., executive summary.
[528] Gongora, 2003, op cit.
[529] See FAO, *Guidelines for Strengthening Animal Health Services in Developing Countries*, FAO, Rome, 1991.
[530] This is with respect to the provision of veterinary services in Africa. Other conditions were that the services are "*genuinely wanted, and perceived to be beneficial to the health of the animals and thus to enhancing the livestock owners' welfare*". FAO *Principles for rational delivery of public*

stakeholders (including BAHA staff members). As has been discussed, this may also result in a greater focus of resources on export activities, to the detriment of other activities. Whereas stakeholder perceptions indicate that BAHA has been limited in the extent to which public good services can be implemented, the PCB, by contrast, has been able to focus heavily on such activities. While it is important for developing countries to facilitate and increase access to export markets, it is also essential that activities that are not directly essential for export access are maintained since these may be indirectly important for this purpose and for domestic health objectives. In some cases it was also suggested that the level of fees might deter stakeholders from utilising services. Other work has also indicated that reduced uptake of services, where service users are subjected to the full cost of those services, is an effect of cost-recovery or privatisation.[531] The improvement in service provision envisaged by the project implementing BAHA might, therefore, not be an automatic effect of cost-recovery and this could have important impacts with respect to Biosecurity (as discussed in Chapter 6).

One reason for the differing levels of success experienced by the PCB and by BAHA with respect to cost-recovery may be the different ways in which this has been implemented. In the case of the PCB, the range of costs involved is relatively limited. The majority of fees are collected from the large importers and agro-chemical companies for the registration and importation of pesticides into Belize. Small farmers pay a fee for their user licence upon receiving certification but the amount collected at these workshops is usually less than the overall cost of running the workshop.[532] The remainder is covered by the other aforementioned fees. By contrast, there may be a number of cases in which producers or processors have to pay fees to the agricultural health authority. Fees are applicable for a range of services necessary to export produce and for importation of

---

and private veterinary services with reference to Africa, Report of a Technical Consultation, 25–27 March FAO, Rome, 1997.

[531] The International Livestock Research Institute notes that this is one argument in support of zero to low cost recovery. It also notes *that "subsidisation has been shown to increase the response to vaccination programmes in Kenya, whereas the imposition of fees for dipping in Tanzania has had the reverse effect"*. See ILRI (International Livestock Research Institute) *Livestock Policy Analysis*. ILRI Training Manual, ILRI, Nairobi, Kenya 1995, p.264. See also FAO, 1991, op cit.

[532] Pesticides Registrar, personal communication, May 2006.

commodities and other services. This means that stakeholders may incur costs relatively frequently and these are perceived by stakeholders to be high. A key factor here appears to be the scope of activities which the agency must undertake. The PCB's mandate is relatively narrow and the agency itself is very small, in terms of personnel (and therefore associated costs). By contrast, BAHA has a very broad mandate with more personnel. It appears in this context, and taking into account the identified perceptions of fees, resource availability and cost-recovery, that the operation of a cost-recovery system has posed less difficulties in situations in which the agency's mandate is relatively narrow and only a limited range of charges are applied. In cases in which the range of activities is much broader it may be difficult to recover sufficient funds to ensure that this full range of activities can be carried out.

One clear difficulty with respect to cost recovery in Belize is that the regulated community to which the fees can be applied is small. In a situation, such as exists in Belize, in which there is a small number of stakeholders who can be charged for a particular service or programme, the costs imposed may be prohibitively high (with the possible result that the regulated community will avoid the use of services or look for ways to avoid the costs). Alternatively, if costs are maintained at an acceptable level, the income generated may be insufficient to cover the cost of the program or to provide a large enough contribution to the provision of services as a whole. In countries with larger numbers of producers and processors the implementation of cost-recovery services may be more efficient. The findings suggest that there is a need to consider whether, in a given situation, cost-recovery is an approach which can be effective and that this may be more difficult in some situations than in others. The identified limitations call into question the extent to which agricultural health services should be publicly subsidised. The FAO has noted, with respect to privatisation of veterinary services in Africa, that "*in most respects, privatisation should be seen as a process that refocuses government veterinary activities on achieving better services for the public and not necessarily as a vehicle for reducing the real magnitude of government expenditure and responsibilities*" and that "*in theory, purely public goods such as public health*

should be financed by the national treasury or by an obligatory user fee (tax) on those who benefit. Where both the public and an identifiable private owner benefit, the cost needs to be approportioned"[533]. In reality, there may be substantial pressure for governments to reduce levels of expenditure but there may nevertheless be a continued need for some level of public funding of these services.[534]

7.3.6 The role of third parties

It is apparent that there are a number of bodies and agencies, of various types, whose involvement influences the outcomes of Biosecurity frameworks. There are three capacities in which these third parties may be involved. The first is providing assistance or support to the regulatory agency. The second is providing assistance or support to the regulated community. The third is in undertaking their own activities which influence the regulatory framework (either directly or indirectly), for example in terms of compliance or enforcement levels.

Assistance to the regulatory agency was identified in the BAHA study and was provided mainly by 'development agencies'. The support provided in this capacity is important in assisting with 'institutional strengthening' and 'capacity building' as well as support for specific programmes. It has been seen that the need for such assistance is identified at the international level. In the present case, the findings indicate that it is often regional agencies, rather than international institutions, for example, that primarily provide this assistance and that involvement with these agencies is clearly beneficial in this respect. 'External consultants' also played a role in providing technical assistance to BAHA, for example in reviewing the legislation. (These may be funded by regional or international agencies). The greater recognition by stakeholders of these agencies having been involved with

---

[533] FAO, 1997, op cit. The ILRI discusses that on some occasions cost-recovery is justified and indeed beneficial in ensuring services can be maintained and that "*when the service provided is of an individual (or curative) nature, governments should give serious consideration to the recovery of all costs, since producers receiving individual attention are normally quite willing to pay for it*" ILRI, 1995, op cit.

[534] The pressure to gain adequate income, where public funding is lacking, might also induce governments and institutions to rent-seeking behaviour. This means that, for example, fees or charges are imposed but are not, in reality, exchanged for services or other benefits. http://en.wikipedia.org/wiki/Rent_seeking

BAHA, compared with the PCB perhaps reflects the wider mandate of BAHA within the broad area of agricultural health and also the responsibilities of BAHA with respect to international trade.[535]

In both studies third parties were identified as providing assistance and technical support to the regulated community. This involvement is important in increasing the ability of regulated stakeholders to comply with regulations and also in alleviating, in some respects, the regulatory burden of the relevant agency. This involvement can again, therefore, be a positive influence on the success of a regulatory framework. The findings of the BAHA study suggest that, in some cases, exporting or larger-scale producers or processors may have access to assistance from third parties which small-scale, non-exporting producers do not, for example from external consultants. It is important to note also that the international trade dimensions of Biosecurity mean that exporting producers may interact with more than one regulatory agency. It has been seen in Chapter 6 that the authorities of importing countries were sometimes identified as playing a regulatory role by these stakeholders. Clearly on this basis, and in light of the influence of the regulations of importing authorities as well as international standards, there is a range of sources and agencies which affect the practices of the exporting private sector.

In light of the various roles played by different third parties it is important that this involvement is properly identified and is utilised as effectively as possible. This is particularly important for developing countries because it may enable the more efficient use of resources, as well access to assistance which would not otherwise be available. For example, the provision of training and education to the regulated community, identified in both studies, can help to relieve the burden on the regulatory agency of undertaking these activities. Where regulatory agencies are unable to provide certain activities, for example the provision of educational activities by BAHA, the involvement of other bodies can help to bridge a

[535] Assistance has been provided to the PCB in the past, for example by PAHO, but the broader range of activities that BAHA is engaged with, according to the more extensive mandate, means

regulatory gap and thus strengthen the overall level of regulation. Similarly, assistance provided to the agency, such as support for international participation, can strengthen the position and capabilities of the agency that would otherwise not have the resources for such involvement.

As mentioned, however, it is important that there is proper recognition of the ways in which third parties are involved with, and influence, the regulatory framework. Recognising the involvement of different bodies, including regulatory agencies, can help to prevent overlaps in their roles. This is particularly important with respect to Biosecurity frameworks, in which a range of third parties might be involved. Whether or not Biosecurity is regulated by one lead agency or on a sectorial basis, the difficulties arising with respect to conflicting mandates are likely to be a concern for developing countries generally.[536] This recognition is also important for the identification of gaps or areas in which further involvement from the regulatory agency is needed. For example, in the case of BAHA, some stakeholders may have access to consultants who can assist them in implementing required changes. Others will not and may therefore have greater difficulties in achieving compliance. This will indicate a gap which again the regulatory agency will need to address.

There may be a need to monitor the involvement of these third parties, including those represented on the Board of Directors, to ensure that anticipated or implicit roles are actually being fulfilled. In the case of the PCB, for example, there was a need to ensure that communication actually takes place between Board members who are also producers association representatives and farmers. As discussed in Chapter 5 it is also important that regulated parties who also play a third party role continue to be subject to regulation and enforcement so that confidence in the

---

that there are more relevant third parties and a greater diversity of relevant opportunities in which they might be involved.

[536] For example, in the present case it appeared that relations between BAHA and the Customs Department were good but Sarpong has identified difficulties between the relevant regulatory agency and the Customs Department for the control of invasive alien species in Ghana. Sarpong, George A., 'The Legal Regime for the Control of Invasive Alien Species (IAS) in Ghana: some lessons in the implementation of treaty norms', *FAO Legal Papers Online*, no. 40, December 2004. The issues surrounding the regulation of food safety in Belize have been discussed in Chapter 6.

regulatory system is maintained and to prevent abuses of this role. It is important, regarding the issues discussed in this section, that agencies recognise not only those parties playing an 'official' role—such as regulatory agencies and, as was the case for BAHA, 'partners in development'—but also the *de facto* roles that are played by a wide range of stakeholders including external regulatory authorities and stakeholders within the domestic private sector.

7.3.7 Governance

The findings of both studies indicate that to maintain a successful regulatory framework it is important to ensure that all relevant parties, including the Secretariat, the Board of Directors and the relevant Minister(s), are aware both of the roles they are expected to fulfil within the framework and the scope of their duties and responsibilities. Similarly, there is a need to ensure that these duties and responsibilities are in fact discharged appropriately.

The role played by the Board of Directors is important in ensuring that policies are adopted and communicated effectively. For this reason the Board members need to be aware of the pressures and needs occurring within the regulatory framework. In the case of BAHA, for example, it was suggested by one stakeholder that Board members were not fully aware of the responsibilities of BAHA within the international legal framework. In the case of the PCB there were, on several occasions, disparities between the perceptions of Board members and those of non-board members, including the Secretariat. Appropriate policies, including decisions related to the allocation of resources, adoption of regulations and the need for regulatory programmes and actions, will be less effective where these do not take into account the needs and opinions of the regulated community and the other responsibilities and pressures on the agency. For example, in the case of the PCB there was a difference in the perceived approach of the PCB to enforcement. This means that the identified need for enforcement might not be adequately addressed, since Board members have a different perception of what the present approach is from other stakeholders, though, as identified in Chapter 5, all identify a need to increase enforcement levels. One stakeholder in the BAHA study commented that the Board was focused only on cost-recovery and this may partly

explain why there has been relatively little focus on education and public awareness, despite the strong support for such activities (Chapter 6).

There must also be a clear understanding of the differentiation of responsibilities of different parties within the regulatory framework. It was noted in Chapter 6 that in the case of BAHA, policies may be adopted by other ministries which undermine or conflict with those of BAHA. Clearly this can, to some extent, negate the purpose not only of the Board but of the regulatory framework as a whole. Similarly, individuals, including members of the Board of Directors, must be aware of the role they are expected to play. It has been seen that in the case of the PCB, communication between Board members and the regulated community had been anticipated but it was perceived by one member of the PCB Secretariat that in fact this had not taken place as expected.

The issue of intervention, with regulatory or enforcement decisions made by BAHA staff, was also an identified concern. Clearly this may arise because of a plain misuse of powers and this was the suggestion in some cases. However, in other cases it was considered that this problem resulted from the provisions of the primary legislation or as a general characteristic of the legal system, namely that general powers of decision-making are afforded to the relevant minister. Such perceptions indicate the need to ensure that all relevant parties have a thorough understanding of the nature of the various roles. It is certainly a common feature of legislation to afford such powers but these are not usually intended to be exercised for the purpose of individual enforcement decisions or for similar 'day-to-day' purposes. The issue of intervention also illustrates the need for a strong and supportive Board of Directors. Intervention was not an issue identified in the PCB study; one interviewee commented that that one of the reasons for this was that in the event of potential undue influence, the Registrar was able to stand up to the relevant person(s), safe in the knowledge that they would receive the full backing of the Board of Directors.[537]

---

[537] PCB interviewee 41, personal communication.

It is also important for the regulatory agency to establish the extent to which it is expected to operate within, or independently of, its parent Ministry. The PCB appears to have had some level of success in this respect, including with the functioning of its Board of Directors (communication issues notwithstanding) and lack of intervention with controls. It has also operated largely independently. BAHA's mandate means that it falls more closely within the overall remit of the Ministry of Agriculture and is therefore less autonomous than the PCB. This appeared to be a concern for some stakeholders, who felt that it was inappropriate for BAHA to be essentially autonomous with respect to funding but to be closely influenced by its parent Ministry with respect to its regulatory responsibilities. In this respect the perceived level of support provided to the regulatory agency from the parent Ministry was also an issue arising in the BAHA study. Though Gongora notes that "*the attitudes of the Minister of Agriculture, Fisheries and Cooperatives and other government ministries towards BAHA have always been supportive and encouraging*"[538], the findings indicate that even if this is the case, it is not perceived to be so by a number of stakeholders.

The challenges and issues discussed above are reliant to some extent on the support and policies of central government. In order to prevent conflicting policies and decisions which may increase risks to human, animal or plant health, as well as potentially constituting unjustifiable trade barriers, there must be clear and unified policy objectives at the highest possible level. There is also a need for effective communication at all levels, so that all relevant parties understand the actual difficulties arising within the framework, the responsibilities and objectives of the regulatory agency, which parties have authority for decision-making and the circumstances under which this arises. In this respect there may also be some need for technical expertise, with relation to understanding and interpretation of the legislation and the powers and responsibilities prescribed therein.

---

[538] Gongora, 2003, op cit., p.469.

7.4 RECOMMENDATIONS TO THE REGULATORY AGENCIES

Section 7.3 considered the main issues seen to influence the success of the Biosecurity frameworks that have been studied in Belize and the broader implications of those findings for developing countries. It has been seen that issues also arose with respect to each regulatory framework within particular circumstances. On this basis it may be useful, from the point of view of BAHA and the PCB, to provide some specific recommendations, based on the findings of the relevant studies. These recommendations might also be useful for other regulatory agencies that identify parallels or similarities between these findings and their own circumstances.

7.4.1 Recommendations to the Pesticides Control Board

7.4.1.1. Enforcement

The PCB has identified enforcement as a priority area. The findings indicate that this is identified and supported as a priority by other stakeholders and that this is needed to address some ongoing problems. It is suggested that the PCB introduces some further degree of enforcement as soon as possible. The issue, however, is how this should be approached. As indicated in the preceding section, enforcement action should not have the effect of ruining livelihoods. In this respect the 'visibility' of the enforcement action should be as much of a concern as the level of penalty imposed. The PCB needs to make stakeholders aware that they will take action in the event of non-compliance but equally this should not be pursued to the detriment of the positive relationships which the PCB has established.

The role of the technicians should also be addressed. The PCB had suggested that one technician was to be given responsibility specifically for enforcement.[539] This might be an effective approach: it should allow pesticide users and other regulated stakeholders to maintain positive and informal relationships with their 'local'

technician and to seek advice and assistance as necessary. There need not be a 'negative' relationship between the enforcement technician and regulated stakeholders but having a separate technician responsible for enforcement should provide a distinction between assistance and enforcement which may make it easier for the enforcement technician to take formal action in instances of non-compliance, even if this action is in fact education- or compliance-based. It should also increase overall levels of stakeholder awareness of enforcement thus addressing this further challenge.

7.4.1.2 Regulatory gaps

Although difficulties associated with regulatory gaps (in secondary legislation) were relatively minor, the PCB must be mindful of the fact that in these instances they are left with no powers of enforcement in situations in which problems arise. Introducing Codes of Practice, as has been previously recommended, would address this problem without the need to draft more extensive, formal regulations. Alternatively, regulations could be adopted if the PCB considers the use of CoPs to be inappropriate.[540]

7.4.1.3 Communication

This applies to communication between PCB Board members and the PCB Secretariat and to communication between PCB Board members and relevant parts of the stakeholder community. The Board should be kept up-to-date, as far as possible, with issues arising at the 'ground level' and with the activities and approaches of the technicians (broadly, rather than the micro-level activities and decisions made by technicians in the day-to-day discharge of their duties), to ensure that policy developments will adequately account for these. There must also be a clear understanding, on the part of Board members, as to the role they are expected to play in disseminating decisions made at the Board level. This is important for existing Board members and for new members as they are introduced. Informal guidelines outlining these expectations or some similar tool,

---

[539] Pesticides Registrar, personal communication.
[540] Recommendations concerning the adoption of Codes of Practice and possible reasons why these were not pursued, are discussed in Chapter 5.

such as a Memorandum of Understanding, might be helpful in ensuring that these expectations are adequately and uniformly communicated.

7.4.2. Recommendations to BAHA

7.4.2.1 The legislative framework

There are a number of outstanding problems concerning the legislative framework. In some areas the primary legislation (the BAHA Act) is inadequate and does not provide the agency with sufficient powers to act in all the areas that it wishes to. In other cases inconsistencies between, and gaps in, the secondary legislation have been identified. Apart from the stakeholder perceptions highlighted in this study, external consultants have also identified these difficulties and made recommendations on how they should be addressed.[541] The need for clarification and agreement on the roles of BAHA and public health over regulation of food safety is included in this need and should be addressed urgently. It is of the utmost importance that these weaknesses in the legislative framework are addressed so that BAHA is able to discharge its responsibilities effectively and without fear of being challenged by regulated individuals or by Belize's trade partners. The Board should play an active role in pushing forward the need for legislative amendment. Ensuring that this need is properly addressed will assume effective communication between the BAHA Secretariat and BAHA Board members, so that Board members have a working understanding of the limitations of the legislation. It will also assume active participation by Board members and communication between the Board and the Minister and Ministry for Agriculture so that, again, the need for amendment is understood and supported at the higher level.

7.4.2.2 Stakeholder interaction

As discussed in preceding sections and chapters there is a perceived need for increased levels of stakeholder education and interaction between BAHA and the regulated community. Clearly, the extent to which BAHA is able to address this need is largely determined by the extent to which resources can be made available for such activities. Under the present financial arrangements this may be difficult.

---

[541] See for example, Black, R and Outhwaite O., 2003, op cit.

However, BAHA may be able to gain some support from one or more of its 'partners in development'. Without doubt BAHA needs to fulfil its responsibilities with respect to the certification and regulation of commodities for export. It is recognised that BAHA has made substantial progress in this respect. However, some activity with respect to education, particularly of non-exporting producers and the general public, could help to achieve improved levels of agricultural health, which would be valuable for the exporting agriculture sector as well as for domestic health.

There are various ways that this could be achieved including, for example, the publication of leaflets and posters, the broadcasting of information on local radio stations, and educational seminars carried out in villages or schools. It is perhaps worth considering that for many stakeholders export and trade considerations will not be immediately relevant. Instead, a focus on, for example, the need for regulation of imported goods because of the possible environmental impacts of introducing non-native species, food safety issues, and possible implications for small-scale producers in terms of plant and animal health (including through the introduction of pests and diseases which may not be visible), may be a better focus for resources.

Apart from education, BAHA should also pursue, where possible, increased co-operation and interaction with the regulated private sector. The use of committees and user groups, though limited, appears to be well-supported by the private sector and these appear, therefore, to be appropriate mechanisms for increasing inclusion.

7.4.2.3 Other issues

It appears that BAHA may be subject to limitations with respect to its relationship with the Ministry of Agriculture and in terms of implementing a cost-recovery system and the availability of resources. The researcher acknowledges that these are complex and potentially contentious issues and that it would be inappropriate on that basis, and recognising that the findings may not provide sufficient information on the actual state of affairs, in this case, to offer recommendations in

this respect. The following observations, based on the findings, may, however, be noteworthy:

(i) There is a need for clarification of the extent to which BAHA is understood (by its parent Ministry) to be either a 'department' of the MoA or an autonomous/semi-autonomous body, akin to the PCB.

(ii) There is also a need for BAHA to function with a Board of Directors whose members are fully aware of the full range of BAHA's responsibilities and of BAHA's various challenges and priorities.

(iii) Generally, stakeholders do seem to understand and support the need to pay a fee for the use of agricultural health services. It has been seen that the PCB has been able to adopt successfully a cost-recovery system by ensuring that the framework as a whole operates on this basis, rather than by ensuring that the costs are recovered for individual services. It is recognised that the pesticide control framework differs from the agricultural health framework in a number of respects. It may, however, be worthwhile for BAHA to consider whether there are alternative approaches to cost-recovery, which might enable BAHA to undertake activities which are not, in themselves, cost-recoverable and which might also reduce the burden on small-scale producers. This should be considered with the caveat that there should remain a sufficient degree of transparency with respect to the collection and use of fee payments and that cost-recovery should not be applied with a view to profit-making but only to ensuring that adequate levels of regulation can be provided. Comments made in earlier sections and chapters regarding the possibility that some level of subvention will still be necessary will remain relevant even in light of these observations.

7.5 SCOPE FOR FURTHER STUDY

Grounded theory appears to be a useful methodology to apply in projects seeking to evaluate Biosecurity or other regulatory frameworks since it enables the identification of a range of issues and may help to rebut presumptions of the researcher(s) that are in fact inaccurate or irrelevant. In non-academic projects it is suggested that grounded theory could usefully be adopted on a smaller scale than in the present case. This would facilitate identification of issues but would address the difficulties related to the time-scale needed for in-depth grounded theory-based studies. Because it allows a variety of relevant issues to emerge, grounded theory could usefully be applied to other fields of empirical legal enquiry, not only Biosecurity.[542]

The present study developed a range of categories and codes applicable to the analysis of the regulatory frameworks being investigated. There is scope to continue work in this area and to move towards the development of a standard codebook for the evaluation of regulatory frameworks through the analysis of qualitative data and stakeholder perceptions. Data collected from similar studies or future work could be used for this purpose. For example, 'positive' and negative' perceptions were present in both studies and it might be possible to develop a list of codes within these categories which detail the different types of response. A larger body of data would enable the development of a codebook which was standardised, though more abstract than the codes applied in the present (grounded theory) analysis. This would be useful for studies seeking to apply a more deductive approach. Such a codebook would not always enable an adequate level of analysis but it could at least be a useful exploratory analysis tool for studies of a similar nature to the present one (whether academic or otherwise). It could also be useful in providing an overview or summary of data with respect to the categories of the codebook. This might be particularly useful for projects with a very restricted time-frame. Codebooks of this nature are, as identified previously,

---

[542] Of course grounded theory has already been applied to legal enquiry in the field Women's Law and Human Rights, as seen in Chapter 2.

available in many other fields apart from law and this might, therefore, be a useful development within this field.

With respect to Belize specifically, an investigation of a similar nature of the Department of Environment (DoE) might be useful. As has been discussed, difficulties arising from the interaction between international trade and environmental agreements were not significant for pesticides control or agricultural health. A study of the DoE would provide a further opportunity to assess whether or not these difficulties are relevant to Belize and the context in which they arise. Presently, the findings suggest that these difficulties, in the case of Belize, are primarily academic and have caused few, if any, difficulties at the national level.

The findings of the present study suggest that there are a number of ways that further research in Biosecurity could usefully be pursued. Studies of a similar nature (whether or not adopting the same methods) could be undertaken in other countries, to ascertain empirically whether or not the challenges and strengths of Belize's Biosecurity frameworks are of more general application to developing countries. Alternatively, the present study has identified several main themes which appear to be significant for the development of successful Biosecurity frameworks. Any of these might provide a useful basis for study in other developing countries, for example where a similar approach is known to have been taken or, conversely, where a very different or novel approach has been taken.[543] This would further contribute to a body of empirical knowledge indicating successful and unsuccessful or less successful approaches to the implementation of national Biosecurity frameworks. Similarly, it might be useful to pursue the issues identified in Belize in greater detail, in order to gain a greater understanding of how these could be effectively addressed. For example, further research on the financial implications of compliance with international standards, on the

[543] In preparing for a second phase of fieldwork the present researcher had identified Dominica and Mauritius as suitable locations for investigation, in the event that access was not granted for the BAHA study. In the case of Mauritius permission had been granted for the study to take place.

regulatory agency and/or the private sector, could contribute further to the literature examining the impact of these standards on developing countries.

REFERENCES

General References

Abbot, Carolyn, 'The Regulatory Enforcement of Pollution Control Laws: The Australian Experience', *Journal of Environmental Law*, vol. 17, no 2, 2005, pp.161 – 180

Adelman, Sammy and Paliwala Abdul, 'Law and Development in Crisis' *in* Adelman, Sammy and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*, London: Hans Zell, 1993

Alexa, Melina and Zuell, Cornelia, 'Text Analysis Software: Commonalities, Differences and Limitations: The Results of a Review', *Quality and Quantity*, vol. 34, 2000, pp.299–321

Armstrong, A., *Struggling over scarce resources: Women and Maintenance in Southern Africa.* Harare: University of Zimbabwe Publications, 1992

Athukorala, Prema-Chandra & Jayasuriya, Sisira, 'Food safety issues, trade and WTO rules: a developing country perspective', *World Economy*, vol. 26, no. 9, 2003, pp.1395–1416.

Ayres, Ian and Braithwaite, John, *Responsive Regulation: Transcending the Deregulation Debate*, Oxford Socio-Legal Studies, Oxford: OUP, 1992

Backman, Kaisa and Kyngäs, Helvi, A., 'Challenges of the grounded theory approach to a novice researcher', *Nursing and Health Sciences*, vol. 1, issue 3, 1999, pp.147–153

Basu, Arnab K, Chau, Nancy H and Grote, Ulrike, 'Eco-Labelling and Stages of Development', *Review of Development Economics*, vol. 7, no. 2, 2003, pp.228–247

Belize, National Human Development Report 1998, Chapter 2: Status of Human Development in Belize <http://www.belize.gov.bz/library/humandevelopment/chapter2.html> (03/08/2006)

Bentzon, Agnate Wers; Hellum, Anne; Stewart, Julie; Welshman, Ncube and Agershap, Torben, *Pursuing Grounded Theory in Law: South-North Experiences in Developing Women's Law*, Harare: Monde Books, 1998

Black, R., 'The Development of the Pesticides Regulatory System', *LLM (Research) dissertation*, University of Greenwich. 1999.

Black, R and Outhwaite, O, *Strengthening Existing Legal and Regulatory Provision for Animal and Plant Health and Food Safety*, Consultancy Services to the Belize Agricultural Health Authority for the Modernization of Agricultural Health Services Project, Final Report, 31 August 2003.

Black, R., 'The legal basis for control of imports of animal and plant material into the United Kingdom', *Environmental Law Review*, 5 (2003): 179–192. p.181

Blackhurst, Richard, Lyakurwa, Bill and Oyejide, Ademola, 'Options for Improving Africa's Participation in the WTO', *The World Economy* vol. 23 issue 4, 2000, pp.491–510

Boeije, Hennie, 'A Purposeful Approach to the Constant Comparative Method in the Analysis of Qualitative Interviews', *Quality and Quantity*, vol. 36, 2002, pp.391 – 409

Braithwaite, John, 'Rewards and Regulation', *Journal of Law and Society*, vol. 29, no. 1, March 2002, pp.12 – 26.

Brittan, Sir Leon, 'Trade and the Environment', in *Trade, Development and the Environment*, WTO Secretariat, eds., London: Kluwer Law International. 2000

CARICOM <http://www.caricom.org/jsp/community/community_index.jsp?menu=community> (03/08/2006)

CBD, 'Sustaining Life on Earth: How the Convention on Biological Diversity promotes nature and human well-being', April 2000. <http://www.biodiv.org/doc/publications/guide.asp> (03/08/2006)

Centre for International Development at Harvard University, Sanitary and Phytosanitary Measures and Technical Barriers to Trade Summary, 2004 at Global Trade Negotiations Home Page <http://www.cid.harvard.edu/cidtrade/issues/spstbt.html> (02/08/2006)

CIA <https://www.cia.gov/cia/publications/factbook/geos/bh.html> (03/08/2006)

CIEL, Backgrounder on the Johannesburg Summit 2002: Enhancing Compliance and Strengthening Enforcement of Multilateral Environmental Agreements (MEAs) at <www.ciel.org/Tae/Johannesburg_Call_Back2.html> (03/08/2006)

CIEL, *Turning off the Tap: Addressing International Invasive Alien Species Issues*, Center for International Environmental Law, Issue Brief for the World Summit on Sustainable Development, 26 August–4 September 2002

Commission of the European Communities, Brussels, 02.02.2000 Com (2000) 1, Communication from The Commission on the Precautionary Principle

Conference of the Parties to the Convention on Biological Diversity, Global Strategy for Plant Conservation, 'Technical review of the targets and analysis of opportunities for their implementation', Report of the meeting of technical experts on the Global Plant Conservation Strategy, Gran Canaria, 11–13 February 2002, UNEP/CBD/COP/6/INF/21, 5 March 2002

Convention on Biological Diversity, *Alien Species; Introduction*, CBD News <www.biodiv.org/programmes/cross-cutting/alien/> (02/08/2006)

Convention on Biological Diversity, *Economics, Trade and Incentives: Information on Perverse Incentives.* <http://www.biodiv.org/programmes/socio-eco/incentives/perverse.asp> (02/08/2006)

Convention on Biological Diversity, *Sustaining Life on Earth: How the Convention on Biological Diversity promotes nature and human well-being.* <http://www.biodiv.org/doc/publications/guide.asp> (02/08/2006)

Cosbey, Aaron, 'The WTO and PPMs: Time to Drop a Taboo,' *Bridges Between Trade and Sustainable Development*, ICTSD, 5, no. 1 – 3, January – April 2001

Cottrell, Jill, 'Third Generation Rights and Social Action Litigation' *in* Sammy Adelman and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*. London: Hans Zell, 1993.

Cranwell, Michelle, '*A Pilot Study, assessing and comparing pesticide management practices among certified and uncertified farmers in four villages within the Cayo District, Belize*'. University of Vermont, Burlington. College Semester Abroad, 1998

Creswell, John W. *Qualitative enquiry and research design: choosing among five traditions*, Thousand Oaks, London, New Delhi: Sage Publications, 1998

CTE Trade and Environment Bulletin TE/033 10 July 2000

CTE Trade and Environment News Bulletins TE/028 31 March 1999

CTE, 'Report (1996) of the Committee on Trade and Environment' WT/CTE/1, November 1996

Cutcliffe, John R. 'Methodological issues in grounded theory', *Journal of Advanced Nursing*, vol. 31, no. 6, 2000 pp.1476—1484

Dahl, Tove Stang, *Women's Law: an introduction to feminist jurisprudence*. Translated by Ronald L Craig. Oslo: Norwegian University Press, 1987

Davis, Kevin and Trebilcock, Michael J. *What role do legal institutions play in development?*, Draft prepared for the International Monetary Fund's Conference on Second Generation Reforms, University of Toronto, November 8–9, 1999

Encyclopaedia of Nations, <http://www.nationsencyclopedia.com/World-Leaders-2003/Belize.htm> (03/08/2006)

Eugui, David Vivas, *Issues linked to the Convention on Biological Diversity in the WTO: Implementing Doha Mandates*, Geneva: CIEL, 2002

Fairman, Robyn and Yapp, Charlotte, 'Enforced Self-regulation, Prescription, and Conceptions of Compliance within Small Businesses: The Impact of Enforcement', *Law and Policy*, vol. 27, no. 4, October 2005, pp.491–518

Falkner, Robert, 'Regulating Biotech Trade: The Cartagena Protocol on Biosafety', *International Affairs*, vol. 76, no. 2, April 2000, pp. 299–313

FAO Committee on Agriculture Discussion Paper, 'Biosecurity in Food and Agriculture', Item 9 of the Provisional Agenda, Seventeenth Session, Rome, 31 March – 4 April 2003, COAG/2003/9

FAO *Principles for rational delivery of public and private veterinary services with reference to Africa*, Report of a Technical Consultation, 25–27 March FAO, Rome, 1997

FAO Technical Consultation on Biological Risk Management in Food and Agriculture, Final Report of the Technical Consultation, Bangkok, 13 – 17 January 2003 TC/BRM/Rep

FAO, Agricultural Trade Fact Sheet: Trade, Environment and Sustainable Development, <http://www.fao.org/docrep/003/X6730E/X6730E01.HTM> (03/08/2006)

FAO, *Biological Diversity in Food and Agriculture: Convention on Biological Diversity* <http://www.fao.org/biodiversity/CBD_en.asp> (02/08/2006)

FAO, Biotechnology in Food and Agriculture, FAO's Activities in the Field of Biotechnology <http://www.fao.org/biotech/act.asp> (03/08/2006)

FAO, Biotechnology in Food and Agriculture, Statement on Biotechnology, March 2000. <http://www.fao.org/biotech/stat.asp> (03/08/2006)

FAO, Committee on Agriculture, 'Biosecurity in Food and Agriculture', Item 8 of the Provisional Agenda, Sixteenth Session, Rome, 26–30 March 2001 COAG/01/8

FAO, *Guidelines for Strengthening Animal Health Services in Developing Countries*, FAO, Rome, 1991

FAO 'Participation in Development' the website of the Informal Working Group on Participatory Approaches and Methods to Support Sustainable Livelihoods & Food Security (IWG-PA) of the Food and Agriculture Organisation of the United Nations (FAO) at <http://www.fao.org/participation/> (03/08/2006)

FAO, *Understanding the Codex Alimentarius*, WHO–FAO Publication, Rome 2005, available at <http://www.fao.org/docrep/008/y7867e/y7867e00.htm> (03/08/2006)

Faure, Michael G. *Enforcement issues for Environmental Legislation in Developing Countries.* UNU/INTECH Working Paper No. 19, March 1995

Flick, Uwe, *An introduction to qualitative research*, 2nd edition, London, Thousand Oaks, New Delhi: Sage Publications, 2002. pp.65 – 67

Gaines, Sanford E. 'International Trade, Environmental Protection and Development as a Sustainable Development Triangle', *Review of European Community and International Environmental Law (RECIEL),* vol. 11, no. 3, November 2002, pp. 259–274

Ghai Yash, 'Law, Development and African Scholarship', *Modern Law Review,* vol. 50, October 1987, pp.750–777

Glaser, Barney G. and Strauss, Anselm L. *The Discovery of Grounded Theory: Strategies for Qualitative Research.* New York: Aldine de Gruyter, 1967

Glaser, Barney G. *Theoretical sensitivity: advances in the methodology of grounded theory*, The Sociology Press: Mill Valley, California, 1978

Gollier, Christian, 'Precautionary principle: the economic perspective', *Economic Policy*, vol. 6, no. 33, October 2001, 301–328

Gongora. V., 'Veterinary Services in Belize: adapting organisational models to the needs of small economies', *Rev. Sci. Tech. Off. Int. Epiz.*, vol. 22 no.2, 2003, pp.463–471

Gopo, Joseph, M., *Biosafety and Trade issues for Developing Countries*, ICTSD Workshop on Biotechnology, Biosafety and Trade: Issues for Developing Countries, Bellevue: Switzerland, 18–20 July 2001

Goulding, Christina 'Grounded theory: the missing methodology on the interpretivist agenda', *Qualitative Market Research: an International Journal*, vol. 1 no.1, 1998, pp.50 – 57

Government of Belize, *About Belize* <http://www.belize.gov.bz/Belize/welcome.shtml> (03/08/2006)

Government of Belize, *About Belize: people* <http://www.belize.gov.bz/Belize/people.html> (03/08/2006)

Hajost, Scott, A. and Quinlan, J., Shea III., 'An Overview of Enforcement and Compliance Mechanisms in International Environmental Agreements', The International Network for Environmental Compliance and Enforcement, <http://www.inece.org/1stvol1/hajost.htm> (03/08/2006)

Hardstaff, Peter, *The Precautionary Principle, Trade and the WTO*, A Discussion Paper for the European Commission Consultation on Trade and Sustainable Development, Royal Society for the Protection of Birds, (RSPB) 2000

Hessler, Richard M. *Social Research Methods,* St Paul: West Publishing Company. 1992

Hettne, Björn *Development Theory and the Three Worlds: Towards an international political economy of development*, 2nd edition, Harlow: Longman Scientific & Technical, 1995

Hoberg, George, 'Trade, Harmonization, and Domestic Autonomy in Environmental Policy', *Journal of Comparative Policy Analysis,* vol. 3, no.2, 2001, pp.191–217

Holt, J., Black, R., and Abdalla, R., 'A rigorous yet simple quantitative risk assessment method for quarantine pests and non-native organisms' *Annals of Applied Biology* (accepted for publication)

Hseih, Hsui-Fang and Shannon, Sarah E. 'Three approaches to qualitative content analysis,' *Qualitative Health Research* vol. 15 no. 9, November 2005, pp.1277 – 1288

Hutter, Bridget, *The Reasonable Arm of the Law? The Law Enforcement Procedures of Environmental Health Officers*, Oxford Socio-Legal Studies, Oxford: Clarendon, 1988

ICTSD, IUCN and CEESP, 'Workshop 2: Risk, Precaution and Biosecurity'. *Bridges: Trade BioRes – Trade and Biological Resources News Digest*, Special Issue; Bridging Worlds – Trade, Biodiversity and Sustainable Development, 8 September 2003, pp.4–6

IISD, *Trade and Environment: An introduction to understanding and promoting sustainable trade in the WTO*, Newly Independent States WTO/NCSD Project, Background Paper prepared by the International Institute for Sustainable Development, September, 2002

Iles, Alastair, 'Rethinking differential obligations: equity under the Biodiversity Convention', *Leiden Journal of International Law*, 16, 2003, pp.217–251

ILRI (International Livestock Research Institute) *Livestock Policy Analysis*, ILRI Training Manual, ILRI, Nairobi, Kenya 1995

Immordino, Giovanni, 'Looking for a guide to protect the environment: the development of the precautionary principle', *Journal of Economic Surveys*, vol. 17, no. 5, 2003, pp.629–643

Inter-American Development Bank (IDB), *Modernization of Agricultural Health Project*, Project No.BL0003, 1999

IPPC, *Guide to the International Plant Protection Convention*, 2000 (available at <https://www.ippc.int/servlet/BinaryDownloaderServlet/26227_Guide2002_English.pdf?filename=1063264041495_IppcGuide02eb.pdf&refID=26227>) (03/08/2006)

IPPC, Summary of the IPPC, 2001 (available at <https://www.ippc.int/servlet/CDSServlet?status=ND0zNzk1OSY2PWVuJjMzPSomMzc9a29z.>) (03/08/2006)

Isaac Grant. E. and Kerr Willam. A., 'Genetically Modified Organisms and Trade Rules: Identifying Important Challenges for the WTO', *The World Economy*, vol. 26, no. 1, January 2003, pp. 29–42.

Kelle, U., 'Theory Building in Qualitative Research and Computer Programs for the Management of Textual Data', *Sociological Research Online* vol. 2 no. 2, 2002 <http://www.socresonline.org.uk/2/2/1.html> (03/08/2006)

Krueger, Richard A. *Focus Groups; A Practical Guide for Applied Research*, 2nd edition, Thousand Oaks, London, New Delhi: Sage Publications, 1994

Laycock, Angela M. 'The role of Women's Law in Zimbabwe: from legal activism to African jurisprudence', *LLM Dissertation*, University of Warwick, 1996

Lee, Raymond M. and Esterhuizen, Lea, 'Computer software and qualitative analysis: trends, issues and resources', *International Journal of Social Research Methodology*', vol. 3 no.3, 2000, pp.231 – 243

Lomborg, Kirsten and Kirkevold, Marit, 'Truth and Validity in Grounded Theory – a reconsidered realist interpretation of the criteria: *fit, work, relevance* and *modifiability*', *Nursing Philosophy*, vol. 4, 2003, pp.189 – 200

Lowe, Will. 'Software for Content Analysis – A Review', <http://www.wcfia.harvard.edu/misc/initiative/identity/publications/content_analysis.pdf> (03/08/2006)

Mackenzie, Ruth, with Glover, Dominic, 'Harmonisation, Diversity and Uncertainty in International Biosafety Regulation', *Democratising Biotechnology: Genetically Modified Crops in Developing Countries Briefing Series*, Briefing 6, Brighton: UK, Institute of Development Studies (IDS), 2003

Mann, Howard, and Porter, Stephen, *The State of Trade and Environmental Law 2003: Implications for Doha and Beyond.* Winnipeg: The International Institute for Sustainable Development (IISD) and Centre for International Environmental Law (CIEL), 2003

May, Peter J. 'Compliance Motivations: Perspectives of Farmers, Homebuilders, and Marine Facilities', *Law and Policy*, vol. 27, no. 2, April 2005, pp.318–347

Mayeda, Graham, 'Developing Disharmony? The SPS and TBT Agreements and the Impact of Harmonization on Developing Countries', *Journal of International Economic Law*, vol. 7, no. 4, 2004, pp.737 – 764

Mayring, Philipp (2000, June). "Qualitative Content Analysis" [28 paragraphs]. *Forum: Qualitative Social Research [on-line Journal], 1(2).* Available at <http://www.qualitative-research.net/fqs-texte/2-00/2-00mayring-e.htm> (03/08/2006)

McCallin, Antoinette, M. 'Designing a grounded theory study: some practicalities', *Nursing in Critical Care*, vol. 8, no. 5, 2003, pp.203 – 208

Michalopoulos, Constantine, 'The Developing Countries in the WTO', *World Economy*, vol. 22, issue 1, January 1999, pp. 117–143

Morison, Moya and Moir, Jim. 'The role of computer software in the analysis of qualitative data; efficient clerk, research assistant or Trojan horse?' *Journal of Advanced Nursing*, vol. 28 no. 1, 1998, pp.106 – 116

Mukerji, Asoke, 'Developing Countries and the WTO: Issues of Implementation', *Journal of World Trade*, vol. 34 no. 6, 2000, pp.33 – 74

Mulkey, Marcia E. and Chanon, Keith E. 'National Compliance and Enforcement of International Environmental Treaties', conference paper presented at *the Sixth International Conference on Environmental Compliance and Enforcement*, INECE, San Jose, Costa Rice, April 15–19, 2002. See <http://www.inece.org/conf/proceedings2/19-Nationalompliance.pdf> (03/08/2006)

Myers, Greg, *Notes on Grounded Theory*, University of Lancaster, June 2003, <http://bowland-files.lancs.ac.uk/staff/greg/QualRes/NotesonGroundedTheory.htm> (03/08/06)

Neuendorf, Kimberly A. *The Content Analysis Guidebook*, Thousand Oaks, London, New Delhi: Sage Publications, 2002

Neuman, W. Lawrence, *Social Research Methods: Qualitative and Quantitative Approaches*, 5th Edition. Boston: Allyn & Bacon, 2003

Nordström, Håkan and Vaughan, Scott, *WTO Special Studies 4: Trade and Environment*, Switzerland: WTO 1999

OIE member information: <http://www.oie.int/eng/OIE/actes/en_nouvpm.htm/> (03/08/2006)

OIE, *What is the OIE?*, at http://www.oie.int/eng/oie/en_oie.htm (03/08/2006)

Olivares, Gustavo, 'The case for giving effectiveness to GATT/ WTO rules on developing countries and LDCs', *Journal of World Trade*, vol. 35, no. 3, 2001, pp.545–551

Paliwala, Abdul, 'Family Transformation and Family Law: Some African Developments in Financial Support on Relationship Breakdown' *in* Adelman, Sammy and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*, London: Hans Zell, 1993

Patton, Michael Quinn, *Qualitative Research & Evaluation Methods*, 3rd Edition, Thousand Oaks, London, New Delhi: Sage Publications, 2002

Reid, Dylan. *Free Trade, not Forced Trade: How to Settle Seattle.* Canadian Commentary, February 2000 <http://www3.sympatico.ca/dylan.reid/seattle.htm> (02/08/2006)

Renato Ruggiero, 'Trade and the Environment', in *Trade, Development and the Environment*, WTO Secretariat, eds. London: Kluwer Law International, 2000

RING, IISD, *Standards for Sustainable Trade*, A RING–IISD Capacity Building Project, Background Paper 1, IISD, 2002

Roberts, Donna, Orden, David, and Josling, Timothy, *WTO Disciplines on Sanitary and Phytosanitary Barriers to Agricultural Trade: Progress, Prospects and Implications for Developing Countries*. Paper prepared by The World Bank's Integrated Program of Research and Capacity Building to Enhance Participation in Developing Countries in the WTO 2000 Negotiations. Presented at the Conference on Agriculture and the New Trade Agenda in the WTO 2000 Negotiations. Geneva, Switzerland, 1999

Rotherham, Tom, *Selling Sustainable Development: environmental labeling and certification programs*, Conference Paper, Meeting of Technical Specialists and Policy Experts on Environmentally-Sound Trade Expansion in the Americas, The Dante B. Fascell North-South Center University of Miami, October 28–29 1999

Sale, Joanna E.M. Lohfeld, Lynne H. and Brazil, Kevin, 'Revisiting the Quantitative–Qualitative Debate: Implications for Mixed-Methods Research', *Quality and Quantity* vol. 36, 2002, pp.43 – 53

Sarpong, George A. 'The Legal Regime for the Control of Invasive Alien Species (IAS) in Ghana: some lessons in the implementation of treaty norms', *FAO Legal Papers Online*, no. 40, December 2004

Sawhney, Aparna, 'Quality Measures in Food Trade: The Indian Experience', *The World Economy*, vol. 28, issue 3, March 2005, pp.329–348

Schillhorn van Veen, 'International trade and food safety in developing countries', *Food Control*, vol. 16, no. 6, 2005, pp.491 – 496

Schwartz, Risa 'Trade Measures Pursuant to Multilateral Environmental Agreements – Developments from Singapore to Seattle', *Review of European Community and International Environment Law (RECIEL)*, vol. 9, no. 1, April 2000, pp. 63–70

Shivji, Issa G. 'Rights struggle, class struggle and the law' *in* Sammy and Paliwala, Abdul (eds.), *Law and Crisis in the Third World*. London: Hans Zell, 1993

Silverman, David, *Doing Qualitative Research: A Practical Handbook*. London, Thousand Oaks, New Delhi: Sage Publications, 2000

Stilwell, Mathew, *Should the WTO Negotiate New Trade Rules on Genetically Modified Organisms?*, Geneva: Center for International Environmental Law, Draft Discussion Paper, November 1999

Stilwell, Matthew and Tarasofsky, Richard. *Towards Coherent Environmental and Economic Governance: Legal and Practical Approaches to MEA-WTO Linkages.* A WWF–CIEL Discussion Paper. Gland, Switzerland: Worldwide Fund for Nature. 2001.

Strauss, Anselm and Corbin, Juliet, *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 2nd edition. Thousand Oaks, London, New Delhi: Sage Publications, 1998

The World Bank, 'Reform Strategies: What Works, What hasn't?, 'Law and Development Movement', <http://www1.worldbank.org/publicsector/legal/ldmovement.htm> (03/08/2006)

Tian, Huilian, 'Eco-labelling Scheme, Environmental Protection and Protectionism', *Canadian Journal of Economics,* vol. 36, no. 3 August 2003, pp. 608 – 633

Toepfer, Klaus, 'Implementing Multilateral Environmental Agreements at the National Level: The Search for Synergies and Complementaries' in National Councils for Sustainable Development, *NCSD Report 2001: Integrating Global Environmental Conventions At National & Local Levels*, The Councils 2002

Töpfer, K. Statement by Mr. Klaus Töpfer, Executive Director, United Nations Environment Programme, to the Convention on Biological Diversity, Bratislave, Slovakia, 5 May 1998

Trubek, David M. and Marc Galanter, 'Scholars in Self-Estrangement: Some Reflections on the Crisis in Law and Development', *Wisconsin Law Review*, vol. 1974: 1062, no. 4, 1974, pp.1062–1101

UA/ CPI – NRI, Harmonisation of African Phytosanitary Legislation, available at <http://www.au-appo.org/en/article.php3?id_article=11> (03/08/2006)

UNEP, Guidelines on Compliance with and Enforcement of Multilateral Environmental Agreements. 2001. Available at <http://www.unep.org/DEC/docs/UNEP.Guidelines.on.Compliance.MEA.pdf>

UNEP, Resources for Civil Society <http://www.unep.org/dpdl/civil_society/>, (03/08/2006)

United Nations Environment Programme (UNEP) and the International Institute for Sustainable Development (IISD), *Trade and Environment: A Handbook,* Winnipeg: IISD, 2000

United Nations Environment Programme (UNEP), 'Global Strategy for Plant Conservation', Conference of the Parties to the Convention on Biological Diversity, Sixth meeting, The Hague, 7–19 April 2002

USEPA, *Principles of Environmental Enforcement*, USEPA, (with Poland's Environment Ministry and Dutch Ministry), The International Network for Environmental Compliance and Enforcement, 1992. Available at <http://www.inece.org/enforcementprinciples.html> (03/08/2006)

Vallat, B. 'Role of the International Organisation for Animal Health (Office des Epizooties: OIE) in the Control of Foot and Mouth Disease', *Comparative Immunology, Microbiology and Infectious Diseases*, vol. 2, issues 5–6, 2002, pp.383–392

Vaughan, Scott and Block, Greg, *Free Trade and the Environment: The Picture Becomes Clearer*, Quebec: Secretariat of the Commission for Environmental Cooperation of North America, 2002

Ward, Halina, 'Trade and Environment Issues in Voluntary Eco-labelling and Life Cycle Analysis', *Ecolabelling and Life Cycle Analysis*, vol. 6, issue 2, 1997, pp.139 – 147

Webb, Christine, 'Analysing qualitative data: computerized and other approaches', *Journal of Advanced Nursing*, vol. 29 no. 2, 1999, pp.323 – 330
Weiss, Charles, 'Scientific uncertainty and science based precaution', *International Environmental Agreements*, vol. 3, no. 2, 2003, pp.137–166

Wijnstekers, Willem, *The Evolution of CITES*, 6th edition, Geneva, Switzerland: CITES Secretariat, 2001

Wimpenny, Peter and Gas, John, 'Interviewing in phenomenology and grounded theory: is there a difference', *Journal of Advanced Nursing*, vol.31 no.6, 2000, pp.1485–1492

Winter, Gerd, 'The GATT and Environmental Protection: Problems of Construction', *Journal of Environmental Law*, vol. 15, no. 2, 2003, pp. 113 – 140

WTO, 'GATT 1994: What is it?'
<http://www.wto.org/english/thewto_e/whatis_e/eol/e/wto02/wto2_4.htm> (03/08/2006)

WTO, Understanding the WTO Agreement on Sanitary and Phytosanitary Measures, 1998
<http://www.wto.org/english/tratop_e/sps_e/spsund_e.htm> (02/08/2006)

WTO, *Understanding the WTO*, 3rd Edition, World Trade Organization, August 2003

Cases

Australia – Measures Affecting Importation of Salmon, Report of the Appellate Body, WT/DS18/Ab/R, October 20, 1998

EC – Measures Concerning Meat and Meat Products (Hormones), Report of the Appellate Body WT/DS26/AB/R, WT/DS48/AB/R, January 16, 1998

European Communities – Measures Affecting Asbestos and Asbestos-Containing Products, Report of the Appellate Body, WT/DS135/AB/R, March 12, 2001

Japan – Measures Affecting Agricultural Products, Report of the Appellate Body, WT/DS76/AB/R, February

Japan – Measures Affecting the Importation of Apples, WT/DS/245/R, July 15, 2003, Report of the Panel

United States – Import Prohibition of Certain Shrimp and Shrimp Products, Report of the Appellate Body WT/DS58/AB/R, October 12, 1998

United States – Import Prohibition of Certain Shrimp and Shrimp Products, Report of the Panel, WT/DS58/R, May 15, 1998

United States – Import Prohibition of Certain Shrimp and Shrimp Products, Report of the Appellate Body, WT/DS58/AB/R, October 12, 1998

United States – Restrictions on Imports of Tuna, Report of the Panel, (DS21/R-39S/155), 1991

United States – Restrictions on Imports of Tuna, Report of the Panel, (DS29/R), 1994

Legislation and legal texts

Agreement on the Application of Sanitary and Phytosanitary Measures

Agreement on Technical Barriers to Trade

Belize Agricultural Health Act, 1999

Cartagena Protocol on Biosafety to the Convention on Biological Diversity

Convention on Biological Diversity 1992

Convention on International Trade in Endangered Species of Wild Fauna and Flora 1973
Marrakesh Agreement Establishing the World Trade Organisation 1994

Pesticides Control Act, 1985 [Belize]

Statutory Instrument No. 112 of 1996: Restricted Pesticides (Certified User) Regulations, 1996 [Belize]

Statutory Instrument No. 25 of 2001: Belize Agricultural Health Authority (Food Safety) Regulations, 2001

Tanzania, Plant Protection Act, 1997

Tanzania, Plant Protection Regulations, 1998

The General Agreement on Tariffs and Trade 1947

The General Agreement on Tariffs and Trade 1994

International standards and related texts

Codex Alimentarius Commission, 15th Procedural Manual

Codex Alimentarius Commission, 'Food Hygiene: Basic Texts (2003)

Codex Alimentarius Commission, *Hazard Analysis and Critical Control Point (HACCP) System and Guidelines for its Application*, Annex to the Recommended International Code of Practice – General Principles of Food Hygiene

Codex Guidelines for Food Import Control Systems

Codex Guidelines, for the Design, Operation, Assessment and Accreditation of Food Import and Export Inspection and Certification Systems

Codex Principles for Food Import and Export Certification and Certification.

International Plant Protection Convention, Revised Edition 1997

ISPM No. 1: Principles of plant quarantine as related to international trade, 1995

ISPM No. 11: Pest risk analysis for quarantine pests, including analysis of environmental risks and living modified organisms (2004)

ISPM No. 12: Guidelines for Phytosanitary Certificates, 2001

ISPM No. 15: Guidelines for regulating wood packaging material in international trade, 2002

ISPM No. 20: Guidelines for a phytosanitary import regulatory system, 2004

ISPM No. 4: Requirements for the establishment of Pest Free Areas, 1996

ISPM No. 5: Glossary of Phytosanitary Terms, 2005

ISPM No. 6: Guidelines for surveillance, 1997

ISPM No. 7: Export Certification System, 1997

OIE, Terrestrial Animal Health Code