SCOPING STUDY ON THE PROSPECTS FOR SUSTAINABLE TREE CROP DEVELOPMENT IN SUB-SAHARAN AFRICA

A paper prepared for the World Bank

Claire Coote, Peter Greenhalgh and Colin Shearing

Natural Resources Institute
University of Greenwich
Chatham Maritime ME4 4TB, UK

May 2001

TABLE OF CONTENTS

EXECUTIVE SUMMARY

Introduction

Objectives

1. The objectives of this short scoping study are to identify key issues for development of the tree crop sector particularly smallholder production, and to draw attention to opportunities for World Bank funding of tree crop initiatives as a focus for possible productive investment in sub-Saharan Africa, and for in-depth examination in a wider study. The study looks particularly at issues relevant to new crop development/replanting and those arising from liberalisation.

Why trees?

2. Tree crops are not an objective in themselves but have an important role within poverty reduction strategies Like any other commodity, they require a whole set of related policies and services. Tree crops have tended to be excluded from agricultural development investment but they have an important role in providing income over time and reducing risk in a farming system. They may require particular instruments for financing.

3. Perennial tree crops, in particular cocoa, coffee, tea, oil palm, rubber, cashew, coconut in the humid tropical belt and shea nut (Karité) and gum arabic in the Sahelian region, provide the main source of exports and foreign exchange earnings for many African countries, particularly for the least developed.

4. Cocoa is Africa's most important tree crop. It provides 70% of world exports, worth nearly US$2 billion. Africa also supplies 15% of the world coffee market, worth US$1.4 billion. African production of rubber, oil palm, coconut, cashew and tea provides a small share of world exports but is an important source of income to certain countries. Africa supplies most of the world demand for shea nuts and shea nut butter, and gum arabic.

5. In spite of diversification into other export crops, and declining real prices, tree crops remain a vital source of income and employment for millions of smallholders. The poorest strata of the population are frequently involved in commodity production. Tree crop output could probably be doubled through better agronomic and post-harvest management and new, high yielding planting stock but there are few mechanisms to reach the millions of producers.

Experience to date

6. The focus of World Bank investment in Africa is through poverty reduction strategy programmes (PRSP) and community based rural development projects (CBRDP) which are primarily concerned with processes rather than revenue-generating activities. The objective of CBRDPs is to promote sustainable development in rural area; investment in the tree crop sector would complement and enhance these programmes.

7. In Africa there has been no Bank lending for tree crops for 12-15 years whereas there has been substantial support for this sector in Asia, and in Latin America; overall, there are indications that policy for Africa differs from these other regions. There is need to explore new financing instruments to attract investment such as

through CBRDP. For example, in Colombia CBRDP-type funding has been used for smallholder oil palm development with a community-private sector agribusiness partnership; in Asia various instruments are used for long-term financing such as cess and trust funds, grants and commercial credit. The opportunities offered by private-public partnerships for financing tree crop expansion and processing plants in Africa should also be explored. Other donors and research organisations heavily involved in this sector e.g. Common Fund for Commodity funding of commodity support projects; USAID's Sustainable Tree Crops Programme in West Africa.

8. There are a number of reasons why tree crop development projects were not as successful as initial assessment indicated. Analysis of past tree crop projects indicates the importance of ascertaining agro-climatic suitability for new planting and rehabilitation; land availability and tenure; labour availability; status of infrastructure; pest and disease control; availability of quality planting material and other inputs; appropriate project development models; management capability; research, extension, banking and credit; product demand and marketing structures.

Tree crop markets

9. Tree crop commodity markets are typified by slow demand growth and over supply but deserve less generalisation as there are some growth areas e.g. quality products, niche markets, increasing local demand. There is a need to look at the comparative advantage of each crop and country. The least developed countries of Africa are losing market share to more developed African countries and to competitors in Asia and Latin America. This has a greater economic impact than declining commodity prices. All producing countries face real long-term declining prices. There are opportunities for Africa in face of rising crop pest and disease levels in Asia. Some countries have been able to develop their economies via the tree crop sector, e.g. Malaysia and Indonesia and to some extent in Côte d'Ivoire and Kenya.

Markets, market access and risk

10. Liberalisation has particularly affected these crops, since marketing boards that played a large role, albeit often inefficiently, in crop purchasing, price management, marketing, quality control, and service provision to smallholders no longer exist. The macro policy environment has not encouraged the private sector to take on these functions. Product quality has often declined due to there being no overall responsibility for quality control resulting in lower prices and loss of price premiums. This is of concern both to producers and governments, for which these crops are a major revenue source. Tree crop commodity users are concerned with quality but farmers lack information on how to increase quality. In some instances importers are reported to be investing in quality aspects at farm level. Although farmers' share of the export price has increased in some countries, they often lack access to inputs, credit, market information and technical support previously provided, and cannot raise productivity. Telecommunications and transport infrastructure are often poor.

11. Liberalised marketing has led to the shifting of risk towards the, mainly smallholder, producers, who experience more volatile prices - a cause of vulnerability - and create difficulties with regard to planting decisions and ongoing crop management. Little information is provided to farmers to show how they could take advantage of new opportunities. Lack of access to trade finance has led to private traders having to buy and sell more quickly than the marketing boards needed to, nor

being able to use futures markets, contributing to lower or more erratic producer prices. Trade finance is a key component of tree crop production and enterprises that surround these activities.

12. Possible risk management tools include:
- Use of "put" options contracts by traders,
- Warehouse receipt finance;
- Use of world market price related price-fixing formulas;
- Promoting formation of groups with sufficient critical mass to generate economic power; and enable delivery of training on production and marketing;
- Development of domestic and regional commodity exchanges.

13. Most tree crops are exported in semi-processed form, which face negligible import tariffs. Processed products are subject to escalating tariffs. Efforts to increase processed exports have met with limited success, related both to marketing and trade aspects as well as technological and infrastructural constraints. Value addition is seen as one way of reducing dependence on exports of primary commodities, although there may be few short-term benefits to tree crop producers.

Long-term financing and new instruments

14. Investing in a long-term tree crop enterprise is inherently more risky than in annual crops. Fundamental tree crop enterprise feasibility must be carefully considered and development initiatives should be both financially and economically viable. In most countries there is clearly a market failure as neither long-term finance nor local investors are available e.g. national pension funds, are reluctant to invest in agriculture. Even for cash crops commercial banks have not been involved, due also to heavily subsidised credit made available to farmers by former marketing boards and agricultural support projects.

15. Possible mechanisms for promoting investment include:
- Public-private partnerships. Tailored credit facilities for small farmers e.g. assess credit worthiness on the basis of crop and off-farm income, not collateral, plus recognition of "sweat" equity; support mixture of short and long-term crops to mitigate against cash flow problems due to long tree crop gestation periods.
- Granting of long-term leases to individuals/groups
- Provision of enabling environment to encourage private sector investment plus long-term plan to develop market for savings mobilisation.
- Responsible, ethical business and importance of role in sustainable development.
- Use of cesses, matching grants, trust funds.

Impact on the environment

16. A key concern is the maximisation of positive benefits of tree crop planting and management while minimising any possible adverse effects through unconstrained expansion of the tree crop area into virgin forest. Carbon sequestration is of possible interest to increase return to growers.

Recommendations and next steps

17. The study and discussions have highlighted many issues concerning the needs of the tree crop sector. No firm conclusions can be drawn at this stage as the need remains for more detailed consideration of these issues, particularly where public, and

private, sector investment should be targeted. The Least Developed Countries have identified seven major areas for action in enhancing productive capacities of commodities: enhancing productive capacities; quality and safety standards; post-harvest measures; horizontal and vertical diversification; marketing; financing; strategic partnerships.

18. Proposals for consideration are grouped around fourteen headings, namely: agro-climatic suitability and land availability; planting materials and inputs; project development models and parameters; general capacity building; farmers' associations; credit and finance, including the development of a warehouse receipts system; market information provision; risk management and trading strategies; improving rural infrastructure, transport and communications; training and other capacity building; quality control; diversification strategies; national and international policies and possible future role of commodity agreements and bodies.

19. During the wider study, an attempt should be made to summarise the outcomes of completed projects by crop and country. Through undertaking a series of representative case studies of completed tree crop projects it should be possible to draw more detailed conclusions from the experience of the past, as a prelude to charting a more appropriate course for future tree crop investment. In addition to areas emphasised above the following areas should be further investigated in a more detailed study:

- Need for specific, targeted interventions, based on study of past performance, including a series of carefully selected case studies, which recognise the heterogeneity of Africa, in terms of climate, soils and landscape; land tenure; infrastructure, private sector involvement, and comparative advantage, skills and knowledge; labour availability, particularly in relation to the HIV/AIDS pandemic.
- Identify success stories in Africa and consider Africa's special advantages.
- Develop a hierarchy of strategic points for tree crops in each country and region. Adding value, for example, although important may be lower down such a list for some producers.
- Look at the different types of possible investment needed - rehabilitation, maintenance of existing planting, new products, market opportunities, product quality, supporting infrastructure - and opportunities to dovetail with/enhance ongoing activities; should include discussions with the CFC, USAID as well as with the private sector and International Commodity Bodies (ICBs).
- Explore/propose new financing instruments including reviewing CBRDPs to identify areas where investments in tree crops would fit in with broad areas identified for funding.
- Examine opportunities for capacity building for smallholder marketing groups.
- Assess comparative advantage both with regard to various countries and tree crops.
- Examine opportunities for increasing access to trade finance.
- Collate and analyse experience gained to date on a number of domestic regional commodity exchanges.
- Investigate the development of best practice in access to agricultural markets and services.
- Improving systems of quality control under liberalised marketing schemes.

- Assess training needs and opportunities for developing training modules for government officials, traders, farmers' groups and NGOs in production and marketing.
- Examine opportunities for "joined-up" government, a process initiated in the PRSPs, to ensure relevant ministries with interests in the tree crop sector discuss their development plans and policies with each other as well as with private sector actors.

Other concrete activities that should be considered include:

- A study tour for African producer representatives to visit smallholder tree crop operations in Asia, Pacific and/or Latin America.
- Support participation in the International Conference on The Future of Perennial Crops in Côte d'Ivoire, November 2001 by representatives of least developed tree crop producing countries including farmers' groups.
- Consider establishing a permanent working group to co-ordinate and activate these investigations.

This publication is an output from a project funded by the United Kingdom Department for International Development for the benefit of developing countries.
The views expressed are not necessarily those of DFID.
Advisory and support Services Contract, project code ZW0109

ACRONYMS AND ABBREVIATION

ACP	African, Caribbean and pacific countries
ADB	African Development Bank
CABI	Commonwealth Agricultural Bureau
CBRDP	Community-based rural development programme
CDC	Commonwealth Development Corporation (UK)
CFC	Common Fund for Commodities
CGIAR	Consultative Group on International Agricultural Research
CIRAD	Centre de Coopération Internationale en Recherche Agronomique pour le Développement
EU	European Union
DFID	Department for International Development (UK)
FAO	Food and Agriculture Organisation
FAOSTAT	Food and Agriculture Organisation statistical database
FCEs	Farmer-controlled enterprises
GDP	Gross domestic product
GEF	Global Environmental Facility
GIS	Geographical information system
ICA	International Commodity Agreement
ICB	International Commodity Body
IFC	International Finance Corporation
IMF	International Monetary Fund
IP	Intellectual property
LDC	Least developed country
NGO	Non-governmental organisation
NRI	Natural Resources Institute
NWFP	Non-wood forest product
PRSP	Poverty reduction strategy programme
SME	Small and medium enterprises
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
USAID	United States Agency for International Development
WTO	World Trade Organisation

1 INTRODUCTION

1.1 STUDY OBJECTIVES

This short Scoping Study was commissioned to allow preliminary identification of the issues and opportunities for development of the tree crop sectors, especially involving the poor as smallholder producers and processors of tree crops, in Sub-Saharan Africa (SSA) and to present findings and ideas for implementing a wider study. This wider study would develop the pointers provided in the Scoping Study and seek to identify opportunities for World Bank and other funding.

In spite of the concerted efforts and investment that have been directed towards agricultural development in Sub-Saharan Africa, many of these initiatives have lacked viability and sustainability. For viable development to be fostered, a number of critical analyses are essential as a prelude to action including assessment of viability and comparative advantage as well as how production and trade be stimulated to have a positive impact on poverty, livelihoods, gender and the environment. The tremendous changes that are taking place in the organisation of agricultural sectors brought about by liberalisation may improve the competitiveness of SSA producers and provide greater incentive for producers and others to invest in intensified high quality output.

1.2 STRUCTURE OF STUDY AND METHODOLOGY USED

The preliminary analysis undertaken provides a basis for identification of pertinent issues, constraints and possible solutions. The content, proposed direction of a more detailed study and possible interventions reflect the specialisms and expertise of the team - an agricultural economist, a trade economist and an agronomist - and range from new crop development through to developing institutional frameworks and assistance relating mainly with issues arising from liberalisation.

The executive summary provides an overview of the many issues discussed in more detail in the text and summarises findings, plus ideas for a wider study. The first section defines tree crops; assesses the role and importance of tree crops for sub-Saharan Africa both in the national context and to the livelihoods of the smallholder producers and presents significant characteristics of SSA countries relative to tree crop cultivation. The second section covers relevant physical, technical, organisational, management, processing, marketing, social, legal and infrastructure aspects associated with past tree crop developments. Three topics: markets, market access and risk; long-term financing, and impact of tree crops on the environment - are then considered in greater depth. The final section presents selected topics for policy options and donor actions and discusses areas warranting further investigation for the detailed study. Appendices include a summary of completed World Bank tree crop projects in sub-Saharan Africa since 1974; a description of tree crop development models utilised to date, and climate and soils maps.

References consulted include a selection of World Bank reports, other consultancy reports, published and grey literature and FAOSTAT trade data. A vast amount has been written on tree crops. One of the dilemmas faced by the authors in organising and presenting information for this study was in the danger of generalising, both on a country and continent basis and on a commodity and all tree crop basis. Specific country or commodity examples have been in the text to illustrate a point, but what

may be true for one commodity or country may not apply to others. It is important that future study takes account of this.

Although primarily a desk study, the consultants have had discussions with commodity users and investors. One team member participated, as an observer, at the joint UNCTAD/CFC workshop on Enhancing Productive Capacities and Diversification of Commodities in Least Developed Countries and South-South Co-operation in March 2001. Two of the team presented key findings to three World Bank working groups convened to discuss tree crops in relation to markets, market access and risk; long-term financing; and environmental impact. The report takes full account of aspects discussed and points raised with Bank staff and during the three workshops during the period 9-12 April 2001.

1.2.1 Definition of tree crops and the range and benefits of crops considered

The term "tree crop" is used to denote any perennial, dicotyledonous or monocotyledonous plant species, which has a woody support system and which periodically produces a crop of nutritional, monetary, or environmental value other than, or in addition to, timber. In this study the tree crops considered are cocoa, coffee, tea, coconuts, cashew, oil palm, rubber in the humid tropical belt and shea nut (karité) and gum arabic in the Sahelian region.

Why tree crops? Tree crops are not an objective in themselves but have a role within poverty reduction strategies Like any other commodity, they require a whole set of related policies and services. Each of these areas is very specific and has institutional constraints that are often disregarded. Tree crops have tended to be excluded from agricultural development investment but they have an important role in providing income over time and reducing risk in a farming system. They may require particular instruments for financing.

Tree crops take several years from the time of planting to produce their first crop. It can take several more years before the tree reaches full productivity and a tree's economic life may be several decades. The long period to reach maturity means that there is often a considerable lag between price signals and market supply of the crop. Tree crops should be regarded as offering potentially valuable opportunities for agricultural development. Attributes of tree crop species grown in appropriate areas and utilising appropriate techniques, include the following:

- They are generally environmentally beneficial, provided that their development, exploitation and processing are undertaken sensibly and in a sustainable manner.
- They represent an appreciating asset over a significant number of years
- They can provide an additional source of income in due course, which can be utilised to supplement the household budget above subsistence level.
- There are species and groups of tree crops that can be combined together and with other farming enterprises, to provide a balanced, sustainable and viable future.

Tree crop species are often considered relatively simple to establish and maintain, because of their appearance of permanence and solidity. However, their long period of maturity, poor selection of sites and planting material, substandard maintenance, and inadequate attention to processing and marketing frequently negate their attributes. While there have already been many successful tree crop enterprises within SSA, care

needs to be exercised new planting, to ensure careful matching of species with sites, and the use of appropriate mechanisms and support systems to ensure financial and economic viability and sustainability. Although tree crops provide the primary target of the study, they are not the sole components of viable and sustainable farming systems. Where interventions in tree crop production are being considered a range of food and cash crops, which could be incorporated as intercrops and/or as separate plantings, should also be investigated.

1.3 ROLE AND IMPORTANCE OF TREE CROPS IN SSA

Commodities are the backbone of many sub-Saharan African countries, particularly for the poorest nations classified as Least Developed Countries. They play a dominant role in sustaining the livelihoods of many millions of smallholder producers as well as greatly influencing the incomes received by intermediaries, processors and governments. However, the age structure of many trees is increasing and crop yields are poor.

Table 1.1 shows the relative importance of the tree crops under discussion to sub-Saharan Africa. Of the main tree crop commodities considered here, cocoa, coffee, coconut, cashew, oil palm, rubber and tea, sub-Saharan Africa contributes nearly 19% of the value of world trade. Cocoa is the most important export tree crop for SSA providing 70%, by value, of world exports and contributing the largest amount, in terms of value of exports, of US$1.8 billion. The *Amelonado cocoa* produced is the chocolate industry's preferred type. Coffee is the second most important export tree crop. Sub-Saharan Africa supplies 15% of the value of coffee exports worth US$1.4 billion. (FAOSTAT, 1990-99 average figures). The table also indicates the five main exporters for each commodity together with their share of world exports. With the tropical tree crops - cocoa, coffee, oil palm, coconut and rubber the same countries tend to dominate the market. A list of all SSA tree crop commodity-exporting countries is given in Appendix 1.

Shea nut and gum arabic are produced virtually entirely in Africa from a mix of wild and planted trees. Over 99% of shea butter exports come from Africa and are valued at $670,000 (1990-1999 average value) although most nuts are exported in unprocessed form. The main producing countries are Nigeria, Mali, Burkina Faso, Côte d'Ivoire, Ghana, Benin and Chad. Shea butter is used locally as well as exported. World exports of gum arabic totalled 25,000 tonnes in 1997, worth an estimated US$34m. The main producers are Sudan, Niger, Chad and Nigeria.

In most sub-Saharan economies agriculture and fisheries contribute over 36% of GDP and over 80% of export earnings. More than 70% of their populations are employed, on average, in primary commodity production with a major part engaged in subsistence-type farming. Two to three commodities account for the bulk of each country's export trade, a single commodity sometimes accounting for over 60% of export earnings, as in Uganda and Ethiopia in the late 1990s. Table 1.2 shows the share of export earnings realised by selected African exporters for the crops under discussion. For many of the commodities and countries there has been little change in export structure for 35 years (UNCTAD/CFC 2001; Coote et al, 2000).

Table 1.1 Sub-Saharan Africa's share of world exports and world share of African exporters for 8 commodities, by value (average value 1990 - 1999)

	COCOA	COFFEE	TEA	PALM OIL	CASHEW	COCONUT	RUBI
SSA share of world trade, by value	69%	15%	20%	2.17%	47%	1.51%	1.27
Share of main African exporters, by value	CI 43% GH 14% NG 7% CM 4% TG 0.4%	UG 2.7% CI 2.5% ET. 2.5% KE 2.4% CM 1.2%	KE 15% MW 1.4% RW 0.6% UG 0.6% ZW 0.5%	CI 1.3% CM 0.3% KE 0.3% GH 0.1% BJ 0.1%	TZ 27% GW 8% CI 4% NG 3% KE 0.5%	CI 1.3% MZ 0.1% SZ 0.1% SA 0.03% KE 0.01%	NG 0 CM 0. GH 0 MW 0.
World trade value US$m	2,593	9,344	2,565	4,813	215	1,010	49
Value of SSA exports, US$m	1, 790	1,400	515	104	100	15	6

Notes: *1 Value of shea butter exports only; excludes value of whole nuts exported. Value of nuts exported in 1997 was US$10.04m*

COUNTRY CODES

BJ	Benin	**MZ**	Mozambique
BF	Burkina Faso	**NG**	Nigeria
CM	Cameroon	**RW**	Rwanda
CI	Côte d'Ivoire	**SA**	South Africa
ET	Ethiopia	**SZ**	Swaziland
GH	Ghana	**TZ**	Tanzania
GW	Guinea-Bissau	**TG**	Togo
KE	Kenya	**UG**	Uganda
MW	Malawi	**ZW**	Zimbabwe

Source: FAOSTAT

Table 1.2 Share of total export earnings from selected export crops, 1961-96 (per cent)

	1961-69	*1994-96*
Cocoa		
Côte d'Ivoire	21.3	34.1
Cameroon	30.3	8.7
Ghana	69.8	29.6
Sao Tome & Principe	70.6	63.5
Coffee		
Burundi	66.8	65.6
Côte d'Ivoire	36.4	6.7
Cameroon	25.2	7.3
Ethiopia	57.8	64.0
Kenya	17.8	15.4
Rwanda	52.8	20.8
Tanzania	13.7	20.4
Uganda	43.6	62.0
Tea		
Kenya	10.8	19.3
Malawi	27.0	6.5
Rwanda	2.5	11.1

Source: Reproduced from Akiyama & Larson (1994) quoted in Coote et al (2000), based on FAO Trade Statistics

1.4 IMPORTANCE OF TREE CROPS TO THE LIVELIHOODS OF THE POOR[1]

The production and transformation of tree crops in sub-Saharan Africa is undertaken in smallholder and estate modes, and in various scales and combinations. The mode varies by commodity and by country/region although smallholder production predominates for most tree crops. In spite of diversification into other export crops, tree crops remain a vital source of income and employment for millions of smallholders. The poorest strata of the population are frequently involved in commodity production. This section considers the contribution of tree crops to the household asset base and their significance in poor people's vulnerability context, with particular emphasis on smallholders and similar production modes.

1.4.1 The influence of tree crops on the household asset base

To what extent does the participation in production of particular tree crops increase or lessen access to, or ownership of, particular assets at the household level? Increased income is arguably the most visible impact of tree crops on the asset base of smallholders and other micro- and small-scale entrepreneurs. This demands the distinction between different modes of production, such as smallholder versus estate production. Certain commodities such as coffee and cocoa can be classified as predominantly smallholder crops whereas for others production takes place in different forms. For example, tea is traditionally considered an estate crop, however countries such as Kenya and Malawi have seen an expansion of smallholder

[1] This section is based on a paper by Greenhalgh and Kleih (2000)

production in the recent past. Smallholders contribute more than 50% to national production in Kenya and nearly 10% in Malawi.

It is generally considered that production of tree crops increases smallholders' disposable income (Blowfield, 1994). This in turn has positive knock-on effects on the financial situation of households. In the case of coffee, assuming that about 65% of the export value of coffee is received by producers, globally this represents annual farm income from coffee of the order of US$6 billion. Aside from increased consumption, savings rates also tend to be higher, often resulting in investment in production factors such as equipment or draught power. In Ghana, as a result of cocoa production, levels of farm incomes and rural welfare have grown over time. Tree crop producers of commodities regulated by marketing boards traditionally tended to have easier access to input supplies and credit. However, in the wake of liberalisation this link has been ruptured where private sector schemes have not been able to fill the gap, leading to increased vulnerability of smallholders.

Some estate-based tree crop sub-sectors tended to be seen as exploitative and therefore not pro-poor. A combination of increased self-awareness by estate companies, international awareness and pressure, and legislation have tended to improve terms and conditions in general. While wage levels in the estate and commercial sector may be low, they find their balance within national labour markets, in which there is often an abundance of unskilled and semi-skilled labour, and in which opportunities for self-employment are insufficient. Wages and other benefits paid in this sector cannot operate in isolation from any trends to improved national per capita incomes over the medium-long term. While wages paid in the estate or commercial sector tend to be close to official minimum levels, a steady cash income can be generated when the alternative may be poorer and more uncertain livelihoods. The rates offered by the estates may make it difficult for smallholder producers to compete for labour for crops requiring regular labour inputs such as tea.

Human assets can be increased as a consequence of improved skills and knowledge acquired for tree crop export production. This may involve technical knowledge of producing a crop, improved understanding of quality control mechanisms, or better commercial skills. In addition, increased household income as a result of tree crop production enables better access to health services and higher levels of participation of children in schooling (and estate-based/outgrower commodity production may include some provision of such social services). However, malnutrition has been recorded in Ghana's largest cocoa growing area indicating that income from cocoa growing may not have been used to purchase nutritious food.

Men as smallholders are more active in the production of tree crops, while food crop production tends to be dominated by women. Women tend to have less access to land, input, credit and because food crops are often lower priced than export crops, receive a smaller income. Due to weak conjugal ties in many African societies women may have little access to tree crop income, or involvement in the tree crop production. Neglect of smallholder tea plots in Kenya was reported to be largely due to false expectations by male tea growers concerning their wives availability and willingness to provide large and regular amounts of labour. However, women, by working as labourers, often take advantage of employment opportunities on estates or commercial farms.

Another feature of tree crop production in some countries is the age structure of the smallholders. For example, a large proportion of cocoa growers in West Africa are over 50 years old, and there has been considerable reluctance of younger people to work in the sector. In Ghana, young people are more likely to work as hired labour in order to earn money for investing in their own farms (Blowfield op.cit.). Given the dramatic changes that are occurring to the labour force as a result of the HIV/AIDS pandemic the role of tree crops in labour-constrained households needs to be investigated.

Social capital has been enhanced as a result of membership of farmer groups, which were originally created to fulfil a specific function in the commodity chain.

1.4.2 The influence of tree crops on smallholders' vulnerability

Table 1.3 highlights the factors to consider in the context of commodity production and vulnerability. Future work in this context needs to assess the extent to which participation in the production of a particular tree crop increases or lessens the exposure as well as the resilience of the groups involved to particular trends/shocks/ seasonality.

Table 1.3 Tree Crop Production and Vulnerability

Vulnerability context factor	Examples
1. Trends that cause stress (either regularly or intermittently). The existence of such trends and sudden changes in such trends.	Declining and volatile prices for export tree crops over time; rising environmental degradation (biodiversity loss, pollution, habitat destruction); rising inflation rates and interest on borrowing.
2. Shocks: Conflict between resource users (e.g. large scale/small scale).	Economic shocks (e.g. devaluation); sudden fall in crop availability; outbreak of disease.
3. Seasonality:	Seasonal availability of commodity and implications for incomes; seasonal labour requirements and possible conflicts with other livelihood options; seasonal disease and pest problems; seasonal changes in prices.

1.5 SIGNIFICANT PHYSICAL CHARACTERISTICS RELATIVE TO TREE CROP CULTIVATION

The major physical factors in assessing the appropriateness of a location for sustainable cultivation of tree crops are climate and land characteristics. For the majority of tree crop species, it is the climate, and particularly the quantum and seasonality of rainfall, which is of paramount significance in determining the potential for successful tree crop cultivation. Topography, altitude, temperatures and the physical and chemical properties of the soils are also of importance, and interact with the rainfall patterns to affect land capability potential. ~~Summary maps of the climatic regions of Africa are given in Appendix 4.~~ deleted

Figure 1 that shows the extent and location of the seven main climatic regions in relation to the national boundaries. Figures 2 and 3 provide, respectively, details on the average annual temperatures and rainfall totals, and annual moisture deficits throughout the African continent. The information summarised is clearly over-

generalised and should be supplemented with accurate data at any development location, prior to accurately assessing crop suitability ratings.

Figure 4 provides a summary outline of the extent and location of the six major soil groups represented throughout Africa. As in the case of climatic details, such general classification requires local refinement and detail when assessing local suitability for crop development.

What is clearly evident from these various maps is that Sub-Saharan Africa is a continent of considerable variation and contrast. Generalisations are not possible, and specific development opportunities must be identified for individual countries or groups of countries.

2 EXPERIENCE TO DATE

2.1 PAST TREE CROP PROJECT INTERVENTIONS

2.1.1 Identification of key issues and constraints

Using the information provided in available Project Completion Reports for World Bank tree crop interventions in Sub-Saharan Africa, alongside other pertinent reports and references, an attempt has been made to summarise the key issues, constraints and opportunities, which have emerged. Consideration of key issues and constraints can provide signposts for successful future tree crop development. All completed World Bank tree crop projects in Sub-Saharan Africa since 1974 are listed in Appendix 2.

A salient point, which emerged from the assembly of Project Completion Reports and discussions with Bank staff, is that the World Bank has made no new investments in tree crop planting in Sub-Saharan Africa during the past ten to eleven years although support has been given to tree crop processing (e.g. World Bank/IFC financing for a tea processing plant in Kenya). World Bank resources have concentrated on activities to empower rural people in developing a vision for rural development and agricultural transformation. While it is vital for stakeholders to have a voice and to be able to shape policy, at the same time the need for capitalising African agriculture and increasing its competitiveness is also recognised (World Bank, 2000). In Latin America and Asia a wide variety of instruments are used for financing tree crop interventions including matching grant funding, cess and trust funds.

A number of factors have contributed and interacted to produce the currently unsatisfactory status of agricultural development. In the case of tree crops, whose products are widely traded and emanate from many regions of the world, competitiveness is of paramount importance. With declining commodity prices, some past tree crop investments have failed to yield satisfactory financial and economic rates of return, due to a combination of low yields and disproportionate input costs. This sometimes results from the inherent climatic and edaphic characteristics of the project sites, and their interaction with the productive capability of the crop species and varieties that were used.

Agro-climatic suitability of project areas for the intended uses, and associated viability

Although many locations in SSA are ideally suited, from an agro-climatic point of view, for a particular tree crop enterprise, the boundaries are often stretched with a view to increasing project area, or providing assistance to an increased number of communities. If agro-climatic conditions are not suitable for cultivation of the tree crop concerned, yields suffer both directly and as a result of increased pest and disease incidence, and input costs rise, thus affecting the viability of investments.

Land Availability

Problems have often been experienced with the availability of adequate land areas with appropriate characteristics and quality, within climatic zones that are well suited to the crop(s) to be developed. To the extent possible, suitable land areas should be reasonably compact, especially where concentrated management techniques and/or

specialised central processing are required. Land availability has often been closely intertwined with land tenure systems and social problems.

Land Tenure

Since land (along with labour) is the dominant factor of production in tree crop production throughout SSA, the ability to obtain access to land is a major factor influencing tree crop output and hence smallholder incomes. In Africa there exist complex systems of land tenure, and generalisations regarding their impact on tree crop development need to be treated with considerable care. It has been argued that traditional land tenure systems are a major constraint to tree crop development and productivity, since they limit the interest and the ability to increase production and improve land utilisation, partly by stifling capital investment. There has been an ongoing debate over land reform, which can be simplified into two schools of thought. The first is opposed to the traditional land tenure system and advocates various reforms including total national control over land. The second favours customary systems arguing that they are adjustable to changing economic demands. For example, in Ghana the traditional system has been flexible and supportive of the expansion of cocoa and other tree crop production. Equally important is the fact that serious landlessness or the concentration of land ownership in a few hands is not yet known in Ghana, unlike in many other poor countries. Security of tenure has depended primarily on good social behaviour and generally been quite sufficient to allow and encourage cultivation of cash crops and hence land privatisation by even migrants (Migot-Adholla and Place, 1991; Toulmin and Quan, 2000).

Certain circumstances have been described where titling may be considered - where indigenous systems are absent or weak; where land disputes are common; where major project interventions require full land privatisation, or where population growth and market access have led to intensification of farming systems (World Bank, 2000).

Labour Types and Availability

One of attractions of perennial tree crops has been that a smallholding could be established with family labour. Hired labour is used increasingly but employment for wages of members of an extended family is also important. Studies of different tree crops and countries reveal a variety of labour arrangements, for example - caretakers, sharecroppers, daily waged labour, communal labour and fixed task contract labour - in the cocoa sector in Ghana. In some cases the type of perennial tree crop production is influenced by labour considerations. A one-hectare cocoa farm can be managed with under 30 days of labour inputs per year; while oil palm requires 44 days; robusta coffee 94 days; rubber 20 days and tea 400 days. Labour-use strategies can also affect how the crop is cultivated. For example, share croppers are held to prefer to extend the area cultivated rather than intensify production. In Nigeria farmers with large cocoa holdings prefer to expand acreage rather than increase the amount of time invested in a given land area (Blowfield, 1994).

Smallholder tree crop production is underpinned by complex systems of labour practice, often very different from those in the West and open to misunderstanding by the casual observer, as illustrated by the recent claims of the use of "slave labour" in West Africa. Family labour is used extensively in tree crop production, and non-family labour is not always waged labour as understood in the West. Although family labour is still widely used, it is changing. Smallholders are often simultaneously

entrepreneurs, employers and labourers, which means current social benchmark standards are of limited relevance and can even be potentially damaging.

Infrastructure Status
Infrastructure is a key element of a functioning commodity chain, and of broader-based rural development. Well established tree crop chains are often characterised by improved physical infrastructure in the form of better road access or collection centres, reflecting Government and donor priorities which often favoured the export tree crop sector at the expense of domestically traded food crops. However, lack of adequate and well-maintained road, rail, water and other communication facilities have frequently hampered efficient agricultural/tree crop development.

Pest and disease control
One of the most severe problems faced by cocoa and coffee farmers is pest and disease control. Yield losses due to disease are estimated to range between 10% and 80%. Chemicals, cultural practices and biological control can be used to control pests and diseases. Depressed produce prices do not encourage farmers to use inputs or undertake cultural practices involving costly labour. Prior to liberalisation many producers received free or subsidised pesticides, and many who used to rely on state-sponsored pest and disease control have failed to treat their trees.

Low yields
Declining yields due to age of plants, lack of quality planting material, poor level of technical knowledge and technology transfer.

Input supplies
The availability and timely delivery of inputs is probably one of the most effective ways of raising productivity. Access to inputs (e.g. seeds, chemicals and fertilisers) has often become more difficult as input distribution has passed from the public to the private sector and subsidies have been reduced or removed. This has invariably raised prices and the lack of affordability has either constrained usage or effectively reduced the price received by the grower.

Availability of Appropriate High Quality Planting Material
Shortage of tree crop planting material of appropriate genetic and physical quality has been a general problem with tree crop projects. High quality planting material must be available at the most favorable planting season, if the long-term investment embodied in tree crop projects is to yield a worthwhile return.

Processing and Value Added
Although the extent to which specialised and centralised processing facilities are required depends upon the species concerned, efficient and appropriate processing of tree crop products has a marked beneficial impact on quality and the bargaining power of producers.

Project Development Model and Patterns
Despite the wide range of tree crop development models that exist (detailed in Appendix 2) and have been tried throughout the developing world, appropriate models have not always been utilised.

Management Capability
In many tree crop projects, the management and organisational structure has sometimes led to sub-optimal results.

Research Systems and Extension
Research activities related to tree crops throughout SSA have been sub-optimal for some time. The general inadequacies of appropriate applied and adaptive research, particularly of relevance to smallholder growers, have been severe constraints to successful tree crop development. For example, concentration on a single crop rather than adopting a farming systems approach to reflect the fact that smallholder farmers rarely engage in monocropping. There is no CGIAR centre involvement in tree crop research. A low proportion of government budgets is spent on tree crop research. Crop cesses are sometimes used to pay for some tree crop research. Much of the research in tree crops has been undertaken by the private sector that is neither widely available nor relevant to many of the needs of smallholders. Some research is supported by donors - the French state-supported research organisation, CIRAD, undertakes research in cocoa, coffee, coconut, oil palm and rubber to support more productive crop sectors and ensure agronomic and economic sustainability. There is also need for extension services to take a farming systems/holistic approach that responds to farmers' real constraints rather than providing "exhortations to adopt ideal practices" (Carr, 1993) probably geared more to plantation conditions than smallholder circumstances.

Rural Banking and Credit Facilities
Arising out of the long-term nature of tree crops and the inherent associated risks, there has been a severe decline in the availability of adequate and appropriate rural banking and credit facilities that could help to support future tree crop development. One of the major constraints facing many smallholders and small traders is the lack of affordable credit. This is due to their lack of meaningful collateral acceptable to financial institutions, along with the high transaction costs and high risks (real or perceived), which is further aggravated by the ending of pan-territorial prices. The lack of grower organisations, coupled with insecure land tenure rights and the consequent denial of access to affordable credit, is probably the major constraint facing the cocoa farmers of West Africa and the coffee growers of East Africa. Limited alternative employment and income opportunities for smallholders help to intensify these problems.

Market Information Provision
It is vital that smallholders benefit from the increased availability of knowledge and information, particularly via modern information technologies. In many instances, this can only happen indirectly e.g., decentralised information systems using rural radio can become an important interface between the global flow of information and smallholders in remote areas. The failure of traditional extension services points to the need more effective and pro-poor agricultural knowledge and information systems. Also, the economic environment needs to be sufficiently enabling so that small-scale operators can benefit indirectly from new opportunities due to e-commerce

Government Structural Situation and Institutional Aspects
Control by governments at local and central levels has undoubtedly adversely affected many tree crop projects in the past. Killick (1999) argues that"...it is domestic

inflexibility and policy unresponsiveness which are the main enemies of poverty reduction, not the forces of globalisation". This, perhaps controversial, view highlights the need for adequate domestic policies, which are not only ratified but also implemented. Yields of cash crops are heavily dependent on government policies and management capacity. These include taxation, exchange rate and input-supply policies (Carr, 1993). Cameroon's economy which is highly dependent on one particular crop was devastated after a fall in cocoa prices. Export taxes can disadvantage farmers and discourage agricultural production.

Institutional failure is often at the heart of domestic marketing inefficiency in developing countries. Key institutions are:

- the law (contract law in particular), its enforcement and impartiality
- government policy-formulating organisations (and, importantly, their links with implementing organisations)
- government policy-implementing organisations (and their links with policy makers)
- private sector associations (trade associations and their links with the finance sector and all levels of government)
- formal lending sector
- organisations charged with the provision and maintenance of marketing infrastructure (including the basic means of distributing information)
- informal institutions (for example, moneylenders, cultural and religious trading partnerships, and traffic police corruption). (C. Collinson, NRI personal communication).

Opportunities continue to exist for reform of government structures and operations, thereby facilitating improvement of the tree crop development environment.

2.1.2 Cocoa donor/support initiatives

In view of the importance of the cocoa sector to sub-Saharan Africa a wide range of projects and programmes involving various donors have been, or are in existence, and it is impossible to summarise them here. In the past, many donors both international and bilateral donors (e.g. World Bank, EU, ADB, CFC, DFID, USAID etc) have provided sizeable budgetary support to the sector as well as support for cocoa research and various cocoa projects various cocoa projects, including pest and disease control.

The cocoa industry itself supports some research initiatives. Nevertheless, the perception of cocoa as a plantation crop rather than a smallholder crop - the latter account for over 90% of global production - has minimised the funding from several donor organisations.

One of the latest programmes, which has captured the imagination of industry stakeholders, is the International Sustainable Cocoa Programme (ISCP) and the related Sustainable Tree Crops Project (STCP). The latter has a wider brief than cocoa, although it is the problems of the cocoa sector that is the centrepiece of its activities. The STCP has brought together donor organisations (the USAID is the moving force), producers (predominantly from West Africa), chocolate manufacturers (including Mars and Cadbury), researchers (CIRAD, CABI), environmentalists and NGOs. Against the background of rising cocoa demand, pest and disease threats and changing land use, the STCP aims to support the small farmer through an

international co-ordinated R&D programme. This would also include environmentally sound and pest and disease counter measures, technology transfer, education and training programmes, long term economic incentives.

2.1.3 Role of International Commodity Organisations

Over the past several decades a number of international organisations have been closely concerned with the development of tree crops. Economic aspects, particularly market controls, have been a major area of involvement. As regards the future role of International Commodity Agreements and International Commodity Bodies (ICAs and ICBs), it is important to distinguish between long-term and short-term price stability (Maizels, 2000). The long-term decline in real prices is the result of excess supply. This calls for production strategies being better informed by production and demand forecasts, based on which producer countries can decide their longer-term production plans for a certain commodity while consumption is stimulated and price volatility reduced. However, the Production Management Plan of the International Cocoa Organisation, based on this strategy, has failed because producers are simply unable to exert control over output. Production is prey to disease, pests and weather and output cannot be fine-tuned. The application of the approach is still at an early stage; it needs to be linked closely with diversification strategies, and it remains to be seen to what extent it can contribute to more balanced commodity markets.

From the early 1990s a key role for ICBs has been the accessing of funds from the Common Fund for Commodities (CFC), a small UN-supported international financial institution specialising in multi-country projects which address general problems of commodity production, marketing and trade, particularly for the least developed countries. The shift in the political and economic environment against market intervention has led to the CFC operations being more modest and its "first account" has never been used as intended for market interventions (e.g. buffer stocks). However, some of these funds were released in the late 1990s to helping countries improve commodity marketing and risk management. CFC activities have focussed mainly on the "second account" which funds commodity R & D and measures aimed at encouraging diversification, improving quality, expanding local processing, developing new uses and pest and disease control etc. The CFC is one of the few international bodies focused upon support for commodity trade development. Its agenda has become increasingly poverty focused in line with those of most major donors. It has also increasingly sought to finance projects that explore more novel approaches e.g. with respect to trade finance and ethical trade. Moreover, an advantage of the CFC is that there is an existing structure with established practices, which can provide an overview of commodities and their problems. Projects of particular relevance to tree crops in Africa are listed below.

Recent CFC funding projects on tree crop commodities of relevance to Africa

Cocoa
- Pilot plants cocoa by-products
- Use of molecular biology techniques in search for varieties resistant to witches' broom disease in cocoa
- Cocoa germplasm and conservation: a global approach
- Improvement of cocoa marketing and trade in liberalising cocoa-producing countries
- Establishment of the physical, chemical and organoleptic parameters differentiating between fine and bulk cocoa

Coconut
Coconut germplasm utilisation to promote sustainable coconut production
Coffee
- Study on marketing and trading policies in selected coffee producing countries (completed 1999)
- Improvement of coffee production in Africa by the control of coffee wilt disease
- Enhancement of coffee quality through prevention of mould formation
- Development of gourmet coffee potential
- Integrated management of coffee berry borer
- Coffee market development and trade development in eastern and southern Africa
- Pilot rehabilitation of coffee plantations (project preparation facility approved in 1999)

Rubber
- African Rubber quality improvement
- Evaluation of an instrument for effectively characterising the processing behaviour of rubber

Tea
- Increased demand for tea

2.2 MARKETS, MARKET ACCESS AND RISK

2.2.1 Tree crop markets

Tree crop commodity markets are typified by slow demand growth and over supply with a long-term price decline in real terms (The Economist Commodities Index is at its lowest level in 150 years). This is coupled with stronger market power on the commodity importers' side following increased concentration through mergers and acquisitions and substantial brand advertising. Commodity exporters are in a position of weakened market power following the dismantling of marketing boards with their monopoly over foreign sales, plus a trend against government intervention in world markets to stabilise commodity prices (Megzari, 2001).

A large proportion of commodity production enters world trade and is consumed in industrial countries, with mature markets. Fastest growth is in areas such as Asia, the Pacific, East and Central Europe as well as the producing and other developing countries. There is some growth areas such as for quality products and niche markets.

The declining share of commodity exports, particularly for the Least Developed Countries, is of even greater concern. These countries, three-quarters of them in SSA, have suffered more from loss of market share than from adverse movements in their commodity terms of trade. Competitiveness on world commodity markets is, therefore, considered even more important than stable or improved commodity prices (Megzai, op.cit.). Developing countries such as Côte d'Ivoire and Kenya, and to a lesser extent, Cameroon, appear to have remained successful primary commodity exporters as well as moving into other economic activities.

At a recent UNCTAD/CFC workshop on enhancing productive capacities and diversification of commodities in LDCs (UNCTAD/CFC, 2001) representatives of 24 least developed countries, the majority in sub-Saharan Africa, called for assistance in the following market-related areas:

- Product differentiation and development of niche markets ("decommoditisation" of commodities),
- Value addition through local processing, particularly at the small and medium scale level;
- Entering new regional markets and development of home market;

- Harmonisation of national and regional standards;
- Building of national and regional capacity for quality testing and certification;
- Ensuring consistency in quality and supply from near-subsistence producers.
- Market information and commodity exchanges;
- Price risk management to mitigate the effects of volatile commodity markets;
- Institution and human capacity building.

A major feature of tree crops markets in sub-Saharan Africa over the past decade has been the replacement of state controlled marketing bodies by more liberalised production and marketing environments favouring a private sector- led development. The reorientation towards liberalised policies dramatically changed the relationship between a country's government and its agricultural sector. It has resulted in a reorganisation of public sector institutions; adjustment, usually devaluation, of the exchange rate; a relaxation of foreign investment restrictions; elimination of price controls and import/export restrictions; initialisation of private-sector initiatives to determine agricultural priorities and consolidated democratic practices and institutions (Topper and Caligari, 1999).

Many people in developing countries, including government officials, poorly understand liberalisation. Monopoly marketing and service provision helped to provide smallholders with stable prices and access to various inputs, including credit although it was at a substantial cost with a high degree of inefficiency. However, some people see more problems from liberalisation than benefits. While creating considerable opportunities to raise productivity and output and improve smallholder livelihoods it has created many difficulties. As Oxfam (2000) argues "there is growing evidence that hasty and ill-planned liberalisation, without the appropriate flanking measures, can damage the livelihoods of poor people in developing countries". However, the diversity and complexity of both the smallholder producer of tree crops and producing countries in which they operate makes it difficult to generalise.

Liberalisation has invariably increased competition and lowered transaction costs leading to growers obtaining a greater share of the export unit price. However, risk has been shifted along the marketing chain and smallholders have now become much more vulnerable to global price volatility and uncertainty, creating difficulties with regard to planting decisions, the ability to purchase inputs and to obtain finance and credit and to market access. The ending of pan-territorial pricing has intensified polarisation both within communities and within regions and countries. Intensified competition has tended to lower quality. The abolition of parastatals often weakened quality control systems, which combined with fierce competition amongst traders to obtain products of any quality, led to a deterioration of quality (and price). Changes in the system of quality control and certification have lead to a reduction in the premium obtained and a decline in the reputation of a country's tree crop exports. Meanwhile quality controls and phyto-sanitary regulations are becoming increasingly important. In addition, growers continue to face several other risks including production risks, which can arise from climatic changes, disease; unknown input qualities, the lack of liquidity with which to buy inputs and poor management as well as the long term deterioration in real prices, demand variations, and low liquidity among buyers.

2.2.2 Market access

Producing countries retain an average 15% share of the final retail value of products made from the main primary agricultural commodities while the producing country share for products such as cocoa that require extensive processing is as low as 6-8%. Most exports by producing countries are in semi-processed form, which face negligible duties. Efforts to increase processed exports have met with limited success. This is related both to marketing and economic factors, such as market access, tariff escalation, packaging requirements, blending, retailers' buying strategies, regulatory constraints and capital cost, as well as to technological and infrastructural constraints such as availability of suitable technologies. Large-scale machinery and artisanal methods are often the only two scales available. Extraction rates from artisanal methods are often poor, resulting in lower prices, and wastage. Capacity utilisation and lack of raw material are related issues.

In the light of depressed markets for some traditional export tree crops, some developing countries have opted for horizontal diversification into more promising non-traditional commodities such as horticulture and flowers. However, as many countries are targeting these markets, there is a danger that these too could become oversupplied. Due to the demanding nature of these markets (e.g. high quality requirements), newcomers will find it difficult to compete against established players such as Kenya, Zimbabwe, and Colombia. Despite their currently small size, markets for organic and ethically traded produce appear to have some potential to improve smallholder incomes. At the same time, it is important that related issues such as certification and phyto-sanitary restrictions, do not become a barrier to market entry affecting poor producers or workers.

Adding value to primary products by further processing (i.e. vertical diversification) is considered to have more potential. Thus, by using this strategy, Thailand and Malaysia were able to significantly reduce their dependency on exports of primary commodities. Given the dominance of the agricultural sector in SSA, such a strategy seems indispensable for the creation of much needed non-farm jobs. Owing to cost considerations, global market players increasingly contribute to this strategy by shifting certain operations in the commodity chain (e.g. processing and packaging industries) closer to the site of raw material production. "Adding value to locally-grown agricultural products is one of the keys to an agriculture-led industrialisation strategy. Hindering this potential today is tariff escalation in industrial countries - that is, tariff rates which increase with the degree of processing - that hurts the developing countries and must be reduced" (Binswanger and Lutz, 2000).

As a result of market liberalisation, smallholders now face greater price volatility and uncertainty. While the level of world prices is usually the major component of the price received by growers other important influences will include transport costs and quality. The ending of pan-territorial prices invariably means that the more remote the producing area the lower the price received by the grower. For many producers and traders, transport costs continue to be an important cost component of trading activities and hence profitability. To increase the efficiency of their marketing operations both growers and traders need access to market information on prices, quality premiums and discounts, transport costs, fob prices at the ports, physical and futures prices etc. Farmers (and/or farmers' groups) and traders need these data to facilitate their negotiations and make more informed selling decisions. To exploit the

benefits of trade, poor countries need better economic governance and reforms to attract investment as well as better trade opportunities. This view highlights the need for adequate domestic policies which allows smallholders and other small-scale operators to participate in the commodity chain.

2.2.3 Risk Management

The ending of fixed producer prices has led to greater price uncertainty with international price volatility impacting directly onto the domestic market. Throughout the 1990s, the World Bank and UNCTAD have been promoting the use of improved risk management instruments in developing countries, success of which should be assessed prior to designing new systems. Designing instruments, including insurance schemes against the vagaries of agricultural production (e.g. weather, pests and diseases) that ultimately benefit the poor remains a key challenge in this context.

Traders need substantial amounts of short term credit to fund purchases from growers, who in turn need pre harvest (seasonal) credit to purchase agricultural inputs while post harvest credit is required to ease cash flow constraints, assist in the timing of sales and generally accelerate agricultural development. Smallholders, farmer's groups and traders need to develop risk management strategies. Possible policies and instruments to reduce risks include crop diversification, forward selling, the use of futures and options contracts, warehouse receipt financing, the use of price fixing formulas and outgrower schemes, as well as the development of a domestic or regional commodity exchange (Burnett and Greenhalgh, 2000). In order to adopt various risk management practices and instruments, the experience of other countries and commodities suggests the need to strengthen appropriate producer and trader-based institutions alongside the need to revise administrative regulations and controls, as well as taxation. Moreover, if risk management instruments can be found, these systems can relatively easily be extended to the provision of credit. Several mechanisms have been identified to provide credit, including warehouse receipts and pre-export financing. The development of such receivable-backed lending systems has several prerequisites, including an enabling legal and regulatory environment, as well as the existence of institutions to perform effective licensing and inspection functions.

The greater involvement of small traders in exporting has increased the risk of contract default, and as a result many tree crops are increasingly being sold for prompt or nearby shipment. Moreover, with greater price uncertainty, there is an increased reluctance to advance loans. With increased competition in the marketing chain and greater default risk, there is increasing reluctance to pre-finance traders and producers; as a result foreign companies are handling an increasing proportion of tree crop exports. This is because foreign companies tend to have better access to finance as well as better market contacts and risk management techniques. Throughout SSA local trading companies are finding it increasingly difficult to compete and an increasing proportion of both internal and external tree crop marketing has become concentrated in the hands of a small number of foreign-owned companies.

A number of different price risk management tools that could offset price fluctuations are under investigation and are summarised below.

Futures and options

The use of futures and options contracts, to provide traders with a relatively easy and accessible way of securing a floor price for future sales, is one such tool. Small producers themselves are unlikely to use these but would be indirect beneficiaries.

Warehouse receipt finance
Warehouse receipts enables producer groups and small-scale traders to access bank finance, at a better rate of interest and for longer periods, than from informal sector through use of product as collateral. It provides traders with more opportunity to invest and more flexibility in their sales but if there is no mechanism for hedging there can be an element of speculation. A warehouse receipt gives a bank a better indication of the asset value that will enable it to lend a higher proportion of nominal value. It can revive commodity processing as credit is only needed for commodities in processing pipeline; it frees up working capital and can improve capacity utilisation. However, it can involve high bank charges which may be passed on to customers. It requires institutional components i.e. legal, financial, management capabilities. To make this facility more widespread there is need for assistance with start-up costs to establish necessary structures.

Promoting smallholder groups
Formation of groups with sufficient "critical mass" to generate economic power is an essential step for improving market and credit access, competitiveness and quality control, particularly if (when) pan-territorial pricing is ended. The grouping should be on the basis of addressing specific marketing problems rather than along the lines of "all purpose co-operatives" which often have a reputation for poor organisation, corruption and inefficiency. Issues such as collection and bulking, arranging transportation, price negotiation, access to credit, processing/adding value are marketing matters that can be effectively addressed by groups of smallholders rather than on an individual basis, and enable delivery of training on production and marketing. Examples include the collective marketing of coffee in Tanzania by the Kilimanjaro Native Co-operative Union and a successful cocoa farmer's association in Ghana, the Kuapa Koko. Since its establishment in 1993, and despite a number of major difficulties, it has become a relatively successful and expanding cocoa farmers'group, paying its members prices somewhat higher than the producer price. Its trading arm, KK Ltd., a Licensed Buying Companies (LBC) with Fair Trade status, has become one of the largest LBC and will become a direct exporter. In addition, plans to establish a KKL Credit Union have been announced. KKL's establishment and continuation has been greatly helped by external funding and assistance. Similarly, the Chivinge Coffee Farmers Association in Uganda sells the coffee of its 320 members for which it is able to secure a premium for its growers by insisting on quality. This is reinforced by the association's ability to secure a better price by selling all it members' coffee directly to exporters as a block.

Price formula
Use of world market price related price-fixing formulas, as for example is undertaken in the Sri Lankan smallholder tea production and PNG oil palm production.

Development of domestic and regional commodity exchanges
The development of domestic and regional commodity exchanges has been mooted as an opportunity to enable producers and traders to hedge against price risks without involving the transaction costs and foreign exchange implications of the international

markets. The development of such exchanges would assist smallholders by influencing markets to function in a manner more beneficial to their interests. Benefits could include the provision of a regulated, secure, transparent, competitive forum and central location where producers and traders may trade efficiently; they could act as a price discovery and determination point; facilitate trading on both spot and forward markets; they could guarantee prompt and timely payment in accordance with established standard contractual terms; provide options for secure and reliable off farm storage; guarantee standard specifications of quality, packing and weight; and provide reliable commodity market information on supply and demand, prices, and trends in domestic, regional and world markets.

Value addition
Adding value to primary products by further processing (i.e. vertical integration) is one strategy by which countries can reduce their dependency on exports of primary commodities and lessen risk. Thailand and Malaysia have successfully followed this route. Given the dominance of the agricultural sector in sub-Saharan Africa, such a strategy seems indispensable for the creation of much needed non-farm jobs. Owing to cost considerations, global market players increasingly contribute to this strategy by shifting certain operations in the commodity chain (e.g. processing and packaging industries) closer to the site of raw material production and producing products for the regional market e.g. processing of palm oil into soap; packaging of tea. Hindering this process for exports to industrial markets is tariff escalation and sources of investment.

2.3 LONG-TERM FINANCING AND PROMOTING INVESTMENT

The least developed countries' key concerns include:

- Lack of financial infrastructure
- Need to create enabling conditions to attract foreign direct investment
- Lack of access to bank credit for producers, processors, traders
- High bank interest rates
- Volatile and declining commodity prices
- Need for institutional and human capacity building
- Transfer of suitable production technologies

(UNCTAD/CDC, 2000)

Africa is typified by having relatively little new investment in diversified agriculture and agribusiness; investments that have been made are often due to the fact that the project could not be located elsewhere due to the presence of natural resources or because the investment was intended to serve the local market. Commercial banks are reluctant to finance agriculture due to the uncertainties that surround production and marketing. African aggregate net capital flows are largely official aid flows between governments, or between international institutions and governments. Poor performance in attracting investment may be due to:

- difficulties in improving economic policies;
- lower overall economic performance;
- persistent debt problems;
- greater uncertainty facing investors, both domestic and foreign;
- investment also required for improving infrastructure to help lower transaction costs and improve marketing activities.

Possible mechanisms for promoting investment include

1. Encouragement of public-private partnerships;
2. Use of environmental facilities e.g. GEF;
3. Involvement of smallholder sector: credit facilities tailored towards small farmers; land entitlement e.g. granting of long-term leases to individuals or village/business groups; recognition of "sweat equity";
4. Involvement of government - creation of enabling environment; policy support; review of taxation;
5. Examination of opportunities for linking with responsible business.

Box 1 Public-private partnerships - examples from the rubber industry

Michelin Nigeria Ltd and the European Investment Bank discussing potential for a US$15 million long-term loan to finance expansion of Nigeria's rubber sector, which the Nigerian government is expected to guarantee. The loan represents 60% of the US$25 million required for the establishment of 10,000 ha of new rubber plantations. Michelin will provide the remaining $10 million required. Over the 10 years co-operatives will also benefit from the loan. The beneficiaries will repay the loan through the sale of Michelin Nigeria who will guarantee the farmers competitive prices. In spite of low world prices it is hoped that Nigeria's share of world production will increase as it has the ideal soil type, climate and yield per hectare.

The International Finance Corporation will lend US$3.5 million to the Liberian Agricultural Company, 75% owned by SOCFINAL, a Luxembourg holding company, in the first large-scale private venture in Liberia's rubber sector since the civil war. The project will employ 2,000 people at full production and provide health and education for 10,000 people. Rural infrastructure, including housing, roads, electricity and water supply will be upgraded, and about 800 smallholders earn income by delivering latex to the company.

CDC has operated in the Côte d'Ivoire since 1974. Its investments, totalling US$60 million, include rubber plantations, oil palm, pineapple cultivation and forestry. It has recently opened a new rubber processing factory in the western region at a cost of US$5.4 million, with the capacity to process 12,000 tonnes of rubber annually and employ over 1,000 people. It also purchased the neighbouring rubber plantation and invested in its development, including housing, medical and education facilities. Despite the fall in the price of rubber, which is about a third of its level four years ago when CDC were considering this acquisition, it went ahead with the investment, anticipating that its successful implementation would act as a catalyst for further development in a relatively remote area of the country.
"We see our recent involvement in the Compagnie Heveicole de Cavally as only the beginning of an active future investment programme in the Côte d'Ivoire. We are looking forward to identifying new areas of co-operation and investment with both the Ivorian government and private sector".

2. 4 ENVIRONMENTAL IMPACT

Key considerations concerning the environmental impact of tree crops centre on maximising the positive benefits, and minimise negative aspects, of tree planting and management from a technical viewpoint; looking for ways to ensure positive impacts occur through policies and economic measures, and ascertaining how donor funding could best be used to facilitate this process.

Tree crops are generally believed to be good for the environment and there is growing interest in other benefits from trees e.g. carbon sequestration. However, in order to achieve these environmental benefits, planting should be limited to areas which are well-suited to the crops involved and where it will succeed in financial and economic terms and where environmental impact is addressed. The viability of processing,

including plant size also needs to be considered. A large processing plant will require a minimum planted area to make it viable, which may encourage monocropping and reduce diversity.

Perceptions exist of negative impacts on the environment of tree crops, particularly monoculture practices; association with depletion of soil nutrients, uneconomical use of water resources and overuse of chemicals. From an environmental point of view, any tree crop planting should not involve the destruction or encroachment into existing forested areas, unless land capability studies clearly suggest otherwise.

Over the past century, production of cocoa and coffee in Côte d'Ivoire and Ghana has been maintained by the westward migration of production and labour into virgin forest areas. Very few new areas now exist for further expansion. There are increasing concerns regarding the sustainability of production practices and its environmental impact. The huge increase in world coffee production since the 1950s has adversely affected the environment in some producing countries through soil degradation, water contamination and deforestation, as producers abandoned traditional methods and turned to input-intensive techniques (Oxfam, 2000). More recent trade liberalisation has led to less control over what farmers produce and where they plant, leading to expansion into areas unsuitable for sustainable production and to environmental degradation, biodiversity loss and habitat destruction.

Some tree crop processing is associated with environmental pollution, for example coffee pulping and pollution of water. Practices have been developed, some donor-funded, to deal with these, for example a DFID-funded study by NRI and the Coffee Research Institute in Kenya to identify methods for reducing the volume of water used and processes for improving the removal of wastes from the coffee process. A manual was developed for the coffee industry for improving the effectiveness of their waste management systems.

Research and extension rarely appear to target environmental and sustainability issues. Little information and training is available on environmental protection from better tree crop husbandry and management. The type of information provided by developed country research institutes for temperate products rarely is produced and disseminated in developing countries.

3 FUTURE STRATEGIES

3.1 POSSIBLE POLICY OPTIONS AND DONOR ACTIONS

This section proposes a number of policy options and possible donor actions - many of which could be applied to a range of tree crops and countries. The previous section has outlined areas where past interventions have paid insufficient attention and other problems inherent to the tree crop sector. These include agro-climatic suitability; land availability; pest and disease control; improved plant material and production; land tenure titling; labour availability; research/extension linkages; infrastructure; input supplies; selection of development models particularly with respect to the appropriate balance between private and public sector roles; government structures; market access and trade finance, long-term finance and credit; environmental impact and protection.

In devising strategies to improve the sector it is important to recognise the inter-related nature of many of the risks and constraints, as well as outcomes, faced by smallholders and traders. For example, the lack of liquidity is a very serious problem for many producers and traders; while the development of better-organised and more competitive credit and savings institutions would reduce this problem although these institutions would still face several different risks when providing credit. Weather, disease and price volatility all increase the risk of default, regardless of the liquidity of the credit market. The higher default risk would be reflected in higher interest rates. However, if small farmers, traders and lenders faced less price uncertainly this would help to decrease the risk of default. If lower price uncertainty is reflected in lower interest rates, then smallholders might be able to buy better quality inputs on a more timely basis, and produce larger quantities of higher quality tree crops. This would improve their revenues, and lessen the performance risk faced by the lender. The need for a co-ordinated strategy to minimise the risks and increase the benefits is obvious – and for the foreseeable future it is government departments, with donor support, that will have the remit to co-ordinate and implement such strategies.

The ideas below focus on development assistance, and institutional frameworks, that will have a direct impact on smallholder livelihoods. The proposals have been grouped around fourteen headings, which it should be recognised may have a degree of overlap between them; namely, improved information on soils, climate and land use; improved planting materials and inputs; selection of project development models and parameters; general capacity building; farmers' associations; credit and finance, including the development of a warehouse receipts system; market information provision; risk management and trading strategies; improving rural infrastructure, transport and communications; training and other capacity building; quality control; diversification strategies; national and international policies and possible future role of commodity agreements and bodies.

Accessible Information Base on Soils, Climate and Land Use

Opportunities involve the building and/or use of a sound information base on soils, climate and land suitability, including the establishment of comprehensive GIS databases, against which appropriate crop development could be targeted. Opportunities relative to land use and availability involve the preparation/updating of land use maps within the countries concerned, and carefully relating such information

to the land suitability for a range of crops. Stakeholders should be closely involved in the exercise.

Improved Planting Materials and Inputs

Opportunities will arise from the use of appropriate crop species and improved varieties, based on knowledge that has resulted from commercial experience or research findings. The ability to produce high quality planting material at the correct time and in adequate quantities, will be the outcome of appropriate development models and sound management and extension procedures. Transgenic modification of temperate fruit trees is already taking place in developed countries to improve fruit quality and make fruit more profitable to producers and retailers. Genetic modification of tropical tree crops, for example, to increase pest and disease resistance could benefit millions of smallholder producers. The role of the private sector in supplying improved affordable material for smallholders should be explored.

Project Development Model and Parameter Selection

Opportunities exist in terms of more appropriate selection of development models for future tree crop development projects. It is particularly important to strike an appropriate balance between the roles to be played by governments and the private sector (commercial enterprises and private farmers), and their access to project benefits. Inter-cropping, particularly with perennial tree crops, helps to spread risk. Although inter-cropping strategies are not panaceas for coping with uncertain price trends, they can provide some level of comfort. The main problem attached to inter-cropping is the difficulty of identifying suitable alternative crops and the dilemma over reduced overall yields and returns over the longer term. Donor organisations could assist by supporting the use of GIS techniques to identify suitable agro-climatic areas for specific crops; and a national level they could support and influence government polices that improve and overcome various economic and political constraints, including implementing supportive agricultural policies.

Capacity Building – General

Opportunities for improved management stem from placing increased reliance on the private sector, rather than on governments. The private sector comprises both the farmers themselves and other commercial entities. A whole range of capacity building improvements are possible within the tree crop sector, including strengthening local entrepreneurial and management skills, improving financial institutions and access to credit, developing trade analysis capacity and export promotion centres, improving the collection and dissemination of information needed by market participants. Agricultural research and extension services need to be improved and become focussed on commercial and post-harvest issues. Assistance needs to be given to national capacity building to deal with international level issues, particularly with regard to trade negotiations, the implementation of trade rules and protection of IP rights. Other options include improving infrastructure to help lower transaction costs and improve marketing activities. Smallholder marketing can be helped by improvements in scientific and administrative capabilities, in part to deal with food standards, plant and animal health inspections, and quality controls.

Support to Farmers' Associations
Donor assistance could be provided to replicate farmer smallholder associations with limited objectives. Such organisations should be able to assist with developing effective marketing strategies (e.g. collection, bulking, arranging transportation, price negotiation, processing and value added etc.) as well as access to credit and risk management instruments).

Improved Access to Credit and Finance
Opportunities for future improvement in rural banking and credit facilities will not be easy to achieve in isolation. What is required is greater attention to devising and identifying viable tree crop models for particular areas, which improve farmer cash flow and thereby facilitate improved credit repayment schedules. Donor assistance could be used to develop systems for provision of credit and financial services to growers. The development of the warehouse receipts scheme is one specific proposal to ease access to finance for farmers and traders.

Provision of Market Information
Successful existing systems need to be replicated or new systems developed which would collect and disseminate timely and appropriate market information to smallholders and traders. Information technology could assist the modernisation of the tree crop sector through the use of internet auctions and other types of e-commerce; provision of crop prices and other market information, and electronic toolboxes for policy makers, investors and trainers. The use of the internet as an information and marketing tool is much less advanced in Africa than in the US and Europe (Africa still has a tiny proportion of the world's telephone connections). However, a recent development by a large African-based internet provider plans to develop *e-touch centres* (similar to internet cafés) to put the use of information technology within the grasp of many more Africans.

Risk Management and Trading Strategies
As part of an enabling economic environment conducive to private sector investment, the design of risk management strategies to reduce price risks along the marketing chain needs greater emphasis. This involves, first, the development of a system that will facilitate access to price risk management instruments and, second, the choice of acceptable instruments to be used. Designing instruments, including insurance schemes against the vagaries of agricultural production (e.g. weather, pests and diseases) that ultimately benefit the poor remains a key challenge in this context. Donor support is needed to help develop systems to enable smallholders, farmer's groups and traders to control and manage price risk and volatility.

Improving Rural Infrastructure, Transport and Communications
To maintain and improve competitiveness, farmers and traders need lower transaction costs and improved market access. This can be achieved in several ways including better rural feeder roads, improvements to rail and port infrastructure, while transaction costs can be lowered by improving the communications infrastructure. Although donor agencies are often already involved in funding infrastructure developments, additional funding is needed to improve rural infrastructure, transport and communications. Opportunities for the future will arise in part from targeting tree crop development where appropriate infrastructure exists, and/or favouring development sites where the agro-climatic conditions are ideal and where necessary

infrastructure can be funded against the security of project viability and competitiveness of the resulting products.

Other Capacity Building and Training

Following export liberalisation a number of different types of export companies have become involved in trade. These range from foreign owned companies with considerable expertise in international commodity trading and access to finance to local companies with considerable marketing expertise through to companies with little or no experience in domestic or international trading or export marketing. The latter tend to be at a significant disadvantage unless they are able to develop strategic alliances with foreign companies. The provision of training for these companies is required in a wide range of disciplines, including documentation requirements, commodity price and currency risk management, storage and quality control, transport and shipping. Training within other sectors may also be required, perhaps most importantly in the use of warehouse receipts as loan collateral. The involvement of local and potentially international banks would be required for this to be successful.

Liberalisation of the tree crop sector has tended to reduce input use by smallholders. This is partly because farmers cannot afford to buy at the true economic cost, and partly because of an unsuitable system of distribution and stock losses. Any project that could improve input availability, including distribution channels, as well as provide assistance to farmers on the application of inputs could see relatively quick results in terms of higher yields. The best form of such assistance would be to assist existing extension programmes with the promotion of best practice and applied technology. For example, a system of farmer field schools may be worth developing.

Other capacity building needs include the strengthening of local entrepreneurial and management skills and the improvement of financial institutions and access to credit, as well as the development of trade analysis capacity and export promotion centres. Donor funding could be made available for capacity building particularly with regard to the training of trading company personnel in a range of business practices including export marketing, as well as improving input supply availability through the introduction of best practices.

There is great need for the provision of information and training on tree crop husbandry and management for better environmental protection. The type of information provided by developed country research institutes for temperate products rarely is produced and disseminated in developing countries. Opportunities for donor and private-sector sponsorship should be pursued.

Improved Quality Control

Efforts need to be made to improve quality control through extension, training, the provision of equipment and the development of effective regulatory authorities. Some large private agribusiness enterprises are increasingly providing such services, which not only ensures supplies of acceptable quality but also assist the farmer to obtain both inputs and improved prices. Donor funding could be used to design and implement strategies to try to ensure that cost-effective systems of quality control are adopted.

Strategies for Diversification

Diversification strategies play a vital role in the livelihoods and food security of many poor people. Both donor organisations and NGOs can contribute to the use of improved risk management mechanisms, and the diversification of production. As far as improved market access is concerned for value-added goods the WTO alongside individual countries and their respective trade blocs have an important role to play. They need to take into account the fact that the poorest countries, (LDCs) are likely to require some form of preferential access to international markets for processed products within an "infant industry" approach if in the foreseeable future if they are to succeed in building a domestic manufacturing sector. To some extent, value addition is being supported by multinational corporations in processing or packaging products for local and regional markets e.g. soap, food oil, tyres, tea, instant coffee.

A balance needs to be struck between diversification and specialisation since the latter is required for efficient production and marketing systems. Throughout SSA there is already a diversity of organisations and projects working with smallholders in this area. Often there is a lack of co-ordination between these various efforts, which can make the identification of an individual problem or project area amenable to donor funding very difficult. Donor funding should be used to assist the diversification process that can take a variety forms such as:

- Identification of suitable agro-climatic areas for crop production
- the funding of individual export orientated agricultural projects;
- providing a medium term loan facility for investments with a longer maturity e.g. planting of tree crops, purchasing of agro processing capital equipment.

National Policy Measures
Policies need to reflect a holistic pro-poor framework that, in this context, allows smallholders and other small-scale operators to participate in the commodity chain. Elements of this should include enabling macro-economic environment, taking into account micro- and small-scale entrepreneurs needs; mechanisms to reduce risk and vulnerability of smallholders as a consequence of internal and external shocks; e.g. use of risk management instruments that benefit small producers; horizontal and vertical diversification; measures to improve the asset base of smallholders, e.g. infrastructure, capacity building at community level, improved credit provision; participation of poor people in decision making processes affecting their stake in the commodity chain and promotion of opportunities for women to enable them to play a greater part in the tree crop sector.

Where the commercial or estate sector has an actual or potentially important net contribution to the livelihoods of the poor through employment generation, national policies and institutional processes should additionally provide an environment conducive to private investment. At the same time, policies concerning, for example, appropriate labour standards should be in place.

Opportunities for International Commodity Agreements and Bodies and the Millennium Round Trade Talks
Currently several International Commodity Agreements are being, or will shortly be, re-negotiated. In these renegotiations there is a need to stress greater poverty focus of their actions (e.g. practices to improve bargaining power of smallholders including development of farmers' associations, improved access to credit and risk

management). There is also the need for greater involvement/membership of these organisations from the private sector and international bodies such as the IMF, World Bank, WTO, UNCTAD, CFC and the FAO.

The International Commodity Bodies (ICB) should provide a business forum for private sector participants of a commodity chain. This would include operators from the exporting as well as importing countries, including representatives of workers and smallholders (e.g. farmer associations, and trade unions). Given the importance of some internationally-traded commodities (e.g. cocoa, coffee and rubber) and the number of people depending on them in one way or another, such business forums are indispensable. They can also serve a lobbying function for the industry. At the same time, ICBs need to improve their operational efficiency, including more transparency regarding decision making and budgetary matters. They should expand their role in identifying best practices, co-ordinating R & D and sustainable management initiatives. Two major functions should continue namely: the provision of market data and improvement of market transparency; and continued role regarding projects: identification, implementation, monitoring.

There is a strong case for continued support to the Common Fund for Commodities (CFC) but seeking two main areas of improvements in performance:1) CFC operations have been constrained by the ICBs through which it is obliged to operate, since a number of these (especially FAO-based bodies) have not been particularly proactive in developing proposals, nor do their agenda necessarily conform with those of CFC and there is a need for initiatives in this area; 2) CFC procedures themselves should be made more efficient in order both to speed up the process of project approval and to improve monitoring.

The new *Millennium Round* of trade talks at the WTO provides a vital opportunity for producing countries to effect improvements in the rules governing commodity trade and investment. The dominant objective must be to reduce the substantial agricultural trade barriers, subsidies and tariff escalation that exists in major importing countries particularly in the EU. Policies to assist in trade reform include:

- Strengthening producing countries' capacities to negotiate a fairer deal; which will necessitate a substantial increase in resources to facilitate their ability to analyse the economic and social impacts of a range of policy options.
- Support for "fair trade" and "ethical trade" initiatives
- Promote 'small-holder friendly' quality assurance schemes with the aim of overcoming stringent sanitary and phytosanitary standards.

Specific Options
It is recommended that participation in the International Conference on The Future of Perennial Crops in Côte d'Ivoire, November 2001 by representatives of least developed tree crop producing countries, including farmers' groups, is supported.

It is suggested that a study tour for African producer representatives (from case study countries) is organised to visit World Bank-supported smallholder tree crop operations in Asia, the Pacific and/or Latin America.

It is also recommended that a Permanent Working Group is established, to coordinate and activate the necessary investigations related to examine and exploit the potential for sustainable tree crop development, and sector support in Sub-Saharan Africa.

3.2 FURTHER INVESTIGATION

Given the deep-seated problems of the tree crop sector it is unlikely that this scoping study or a wider study could, in isolation, provide requisite solutions. A range of further work will undoubtedly be necessary to lay a foundation for the establishment of sustainable tree crop development in the future. Key aspects for necessary further work include the following:

- Identify success stories in Africa and assess Africa's comparative advantage both with regard to various countries and tree crop production through case studies.

- Dialogue with governments, local and international entrepreneurs and smallholders to develop a hierarchy of strategic points for tree crops in each country and region, in relation to the potential for their involvement in sustainable and viable tree crop development in the countries involved.

- Examine different types of possible investment needed - long and short-term financing - for rehabilitation, maintenance of existing planting, new planting, market development opportunities, product quality, supporting infrastructure, including opportunities to dovetail with/enhance ongoing donor activity. This should include discussions with i.e. CFC, USAID as well as with the private sector and International Commodity Bodies (ICBs)[2]. Explore new financing instruments, including the possibility of CBRDP funding to identify areas where investments in tree crops would complement planned activities.

- Collate and analyse experience gained to date on a number of domestic regional commodity exchanges. Investigate the development of best practice in access to agricultural markets and services.

- Examine opportunities for "joined-up" government, a process initiated in the PRSPs, to ensure relevant ministries with interests in the tree crop sector discuss their development plans and policies with each other as well as with private sector actors.

The paragraphs which follow summarise the additional work which must be undertaken to complete the detailed study on the prospects for sustainable tree crop

[2] A selection of Completion Reports for World Bank tree crop project interventions in Sub-Saharan Africa has been collated, and all such reports plus similar information in respect of all other donors, will need to be assembled during the detailed study e.g. the Common Fund for Commodities, the African Development Bank, the European Union, USAID and other donors, the Commonwealth Development Corporation as well as by private commercial organisations.

development in Sub-Saharan Africa, and highlight various likely actions which will need to be taken, to devise appropriate future strategies.

3.2.1 Overall identification and scale of the potential for tree crop development

It will be necessary to refine the definition and boundaries of the agro-climatic zones of Sub-Saharan Africa, by using more detailed data and information than that utilised in this Scoping Study. The potential scope and scale of tree crop development within Sub-Saharan Africa can then be more clearly defined using the agro-climatic crop group requirements noted below, in Section 3.2.2.

3.2.2 Definition of the agro-climatic requirements for the various crop groups

It will be necessary to define criteria to be utilised in the evaluation of land characteristics for the various crop groups. A sample land characteristics evaluation table for rubber is given in appendix 5, by way of example.

3.2.3 Assessment of an appropriate sample of case studies

By subjecting a number of completed tree crop projects to more profound examination, it should be possible to define and refine the to date experience which has been gained from the development of a range of tree species, in different situations. For these Case Studies to be truly representative, it is suggested that they should be undertaken for countries in each of the SSA climatic regions summarised below and for the following crops: -

Rainy Tropical Climate Region - oil palm, coconut, robusta coffee, cocoa
Wet and Dry Tropical Climate Region - oil palm, coconut, robusta coffee, cocoa, cashew
Semi-Arid Tropical Climate Region - cashew, gum arabic, shea nut
High Altitude Climate Region - arabica coffee, tea

In undertaking these Case Studies, the following aspects should be among those considered in the evaluation of past tree crop development projects:

- Farming systems utilised
- Topographical, climatic and edaphic characteristics of the development area
- Details of the development model and pattern used
- Details of planting material utilised, input levels and yield profiles
- Details of the levels of financial and economic viability exhibited
- Details of constraints encountered and the extent to which they were overcome
- An assessment of the sustainability of objectives after project completion

Where tree crop planting has been more spontaneous the following additional areas should be investigated:

- Marketing infrastructure and impact of liberalisation;
- Existance and success of farmers' groups;
- Use of price fixing formulae;
- Quality control measures;
- Access to credit and longer-term finance;
- Land availability and titling issues;
- Labour availability, and impact of HIV/AIDS;

- Environmental impacts.

3.2.4 Long term prospects and competitiveness for smallholder tree crop production in SSA

An investment in tree crops is typically a long-term decision. Accordingly, it is dangerous to let investments become unduly influenced by the short run behaviour of market prices. If a period of high prices caused by inadequate production capacities induces heavy investment in new plantings, the optimistic price assumptions underlying the investments may never be realised. Wild swings from under-capacity to over-capacity are made worse by the nature of the economics of tree crops. Once a tree has been planted and allowed to reach maturity, smallholders will have every incentive to continue harvesting it as long as the selling price covers the direct cash costs of harvesting and marketing the crop. For this reason, it is vital to stand back from the short term behaviour of prices and to assess the long term trends and future prospects in the production costs of leading producers of the major tree crops, and their relationship to the long term trends in world market prices. Where smallholders have a choice of crops which they could plant on particular plots of land, and where there is a choice of locations in which to invest, the comparison of production costs and selling prices for each of the crops under consideration will generate a dispassionate, objective means of determining the most profitable crop over the life of the plantation. This is not a simple task. There are many countries competing in the markets for tree crops, and they are each subject to changes in technology and changes in key input costs, such as wages, as their economies develop

The objective of the study would be to present an analysis of the prospects for the world price of seven major tree crops: coffee, cocoa, coconut oil, palm oil, rubber, tea, cashew and shea, alongside a comprehensive set of forecasts of the production costs — and hence the profitability — of leading producers of these crops. One part of the study would review each of the tree crops in turn, using an identical structure: an analysis of the long run behaviour of world market prices; a detailed examination of the distribution of national average production costs in relation to world market prices; forecasts of the distribution of productions costs in 2005 and 2015, taking account of new technologies and the impact of economic development upon each country's wages and other input prices; and projections of world prices in 2005 and 2015. The second part would focus upon approximately 25 countries selected for consideration in the study. The relevant crops will be analysed in each of these countries in terms of: the impact of government policy, both now and in future; the repercussions of economic growth; forecasts of local production costs; an evaluation of the profitability of each crop in relation to the long run trend in its world price.

3.2.5 Improving systems of quality control under liberalised marketing regimes

The abolition of parastatal marketing organisations often led to a weakening of quality control systems. There are several instances where the quality of cash and export crop production deteriorated during the initial stage of market reform e.g. cocoa production in Cameroon and Nigeria, coffee production in Cameroon, Madagascar and Uganda. In part, this was the result of the failure of government to make provisions for the continuation of quality control services following the abolition of quality controls on exports, partly because of exchange rate distortions and partly because of the fierce competition among traders – many of whom had recently entered the business - to obtain products of any quality from farmers.

Following liberalisation, various schemes have been devised for the provision of quality control services. In some cases it has been left to the private sector either in the form of individual companies undertaking their own QC or companies using specialist companies to provide quality assessments. Sometimes public services have continued to undertake quality-monitoring activities. The ability of the private sector to provide QC systems (as well as other services previously provided by parastatals) is a key factor behind the success of market reforms. Many factors will affect the ability of the private sector (or the public sector) to provide QC in a liberalised market environment. These include the nature of the commodity, the role and strength of the private sector prior to reform,

The objective of the study would be to assess for various tree crops and countries the systems of QC that have been developed since market liberalisation. From this analysis best practice guidelines could be devised which would accelerate the process of learning and assistance in the promotion of systems and strategies to improve cost-effective systems of QC. For these reasons the proposed study aims to accelerate the learning process and disseminate guidelines of best practice. The purpose is to effectively promote strategies to accelerate and enhance the process of innovation in the development of agricultural services provided to African smallholders.

3.2.6 Development of best practice in accessing agricultural markets and services

Throughout Africa improved access to markets and agricultural services (mainly input supply, extension, and financial services including credit) offers substantial opportunities for enhancing the livelihoods of tree crop producers. In many cases this requires the development of contractual arrangements between service suppliers and farmers. Co-operation among farmers at the primary level can also assist this process.

Various local and international initiatives have been undertaken aimed at improving service provision usually involving private companies or NGOs. They involve the development of farmer-controlled enterprises (FCEs), outgrower schemes, linkage credit schemes, joint venture companies, inventory credit, input supply networks and rural assembly markets. However, progress in capitalising on these opportunities has been slow, and the range of services available to most smallholders remains weak (with adverse consequences for livelihoods, soil fertility and food security). This is attributed to a combination of problems, including the high transaction costs of dealing with smallholders, default on credit repayments by farmers, absence of trust between farmers and service providers, shortage of entrepreneurs, weak policies and produce quality considerations.

The study would seek to develop strategies which not only provide smallholders with better access to markets but also increase the availability and quality of crops produced. The study aims to accelerate the learning process and disseminate guidelines of best practice. The purpose is to effectively promote strategies to accelerate and enhance the process of innovation in the development of agricultural services provided to African smallholder producers of tree crops. By improving the functioning of markets this will increase incomes and livelihoods.

The project will study the approaches of various organisations (companies, emerging entrepreneurs, NGOs and farmer organisations), in a number of countries. The initial phase of the project would be to identify the most relevant organisation and country.

For each selected organisation there would be an in-depth study of the best practice in market access and agricultural service development. Conclusions would be drawn about the impact and cost-effectiveness of specific schemes adopted. Criteria used to appraise schemes will include sustainability and potential for growth; transferability to other crops and countries; cost-effectiveness, and social inclusiveness - current and prospective. Experiences of different schemes and cases will then be compared, and lessons drawn regarding best practices. Existing models of best practice would thus be identified which could then be disseminated.

3.2.7 Improving marketing systems through the development of contract farming and outgrower schemes

The development of contract farming and outgrower schemes has the potential to substantially improve the livelihoods of many smallholder tree crop producers. Not only can they facilitate the marketing of smallholder produce and overcome the problems of scale economies in the processing of higher value products but also they can be used as important vehicles for obtaining inputs and the delivery of services. There are a number of examples of outgrower and contact farming schemes, such as palm oil in PNG, tea in Sri Lanka, cotton and vegetables in Zimbabwe. Outgrower schemes often involve smallholders supplying raw materials to a local processing operation, including on a nucleus estate; some have been in existence for several decades and have often involved land settlement schemes. The price the smallholder receives is often based on an agreed price fixing formula and such schemes, if fairly devised, can help the functioning of markets to the benefit of the farmer.

The aim of the study would be to analyse a number of these schemes with the objective of finding suitable models, which represent a net improvement in both efficiency and in distribution terms. Following an initial identification of relevant schemes there would follow an analysis of the costs and benefits of a number of operating contract and outgrower schemes with the aim of identifying best practice. Conclusions would be drawn about the impact, cost-effectiveness and social inclusiveness of specific schemes. In appraising each scheme consideration will be given to its potential for replication in other countries and commodities as well as its sustainability and potential for growth. Experiences of different schemes and cases will be compared, and lessons drawn regarding best practices.

REFERENCES

BINSWANGER, H. and LUTZ, (2000) Agricultural trade barriers, trade Negotiations and the interests of developing countries. Paper prepared for UNCTAD X: High level Round Table on Trade and Development: Directions for the Twenty-first century, Bangkok 12 February 2000.

BURNETT, D. and GREENHALGH, P. (2000) A scoping study on the functioning of markets. Chatham . UK: Natural Resources Institute (unpublished)

BLOWFIELD, M. E. (1994) Labour decision-making in smallholder tree crop production: studies from Ghana and Indonesia, Natural Resources Institute (unpublished)

CARR, S.J. (1993) *Improving cash crops in Africa: factors influencing the productivity of cotton, coffee and tea grown by smallholders*. World Bank Technical Paper No. 216

COOTE, C., GORDON, A. and MARTER, A. (2000) *International trade in agricultural commodities - liberalization and its implications for development and poverty reduction in the ACP states*. Chatham, UK: Natural Resources Institute

GREENHALGH, P. and KLEIH, U. (2000) Commodities and Livelihoods: A Bottom-Up Perspective. (Unpublished report prepared for DFID) Chatham, UK: Natural Resources Institute

MAIZELS, A. (2000) Economic dependence on commodities. Paper prepared for UNCTAD X: High level Round Table on Trade and Development: Directions for the Twenty-first century, Bangkok 12 February 2000.

MEGZARI, A.(2001) 'Problems and opportunities of commodity diversification' paper presented at UNCTAD/CFC workshop on *Enhancing productive capacities and diversification of commodities in LDCs, and South-South Cooperation,. Gene*va,

MIGOT-ADHOLLA, S. E. and PLACE, F. (1991) *Land Use Rights and Agricultural Productivity of Ghanaian Farmers*. The World Bank, Washington D.C., in collaboration with Professor George Benneh and Steven Atsu, University of Ghana, Legon, Accra, Ghana.

OXFAM (2000) *Coffee: A Background Study*, Oxford

TOPPER C. P.and CALGIARI, P. D. S. (1999) *Assessment of options and opportunities for tree crop development in East and West/Central Africa*. Biohybrids International, for USAID

TOULMIN, C. and QUAN, J. (2000) *Evolving land rights, policy and land tenure in Africa*. DFID/IIED/NRI, London.

UNCTAD/CFC (2001) Enhancing productive capacities and diversification of commodities in LDCs, and South-South Cooperation, Summary Report and

Recommendations, Geneva, 2001

WORLD BANK (2000) *Can Africa Claim the 21st Century?* Washington, D.C.

Appendix 1: SSA - production, exports and imports of tree crop commodities

Countries	Coconut Products			Oil Palm Products			Rubber			Tea			Cocoa Products			Coffee			Cashew		
	P[1]	E[2]	I[3]	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I	P	E	I
Angola	×	×	×	√	×	×	×	×	×	×	×	√	√	×	×	√	√	×	√		
Benin	√	√	×	√	×	×	×	×	×	×	×	√	×	×	×	√	×	√	√	√	
Botswana	×	×	×	×	×	√	×	√	√	×	√	√	×	×	√		√	√	×	×	
Burkina Faso	×	×	×	×	×	×	×	×	√	√	×	√	×	×	×		×	√	√		
Burundi	×	×	×	√	×	×	×	×	×	√	√	√	×	×	×	√	√	×	×		
Cameroon	√	×	×	√	√	√	√	√	√	√	√	√	√	√	×	√	√	√	×		
Cape Verde	√	×	√	×	×	×	×	×	×	×	×	√	×	×	×	√	×	√	×		
Central African Republic	×	×	×	√	√	×	√	×	×	×	×	√	√	×	×	√	√	√	×		
Chad	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	×	×	√	×		
Comoros	√	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	×	×	×		
Congo	×	×	×	√	√	×	√	√	×	×	√	√	√	√	×	√	√	√	×		
Côte d'Ivoire	√	√	×	√	√	×	√	√	√	×	√	√	√	√	×	√	√	√	√	√	
Equatorial Guinea	√	×	×	√	×	×	×	×	×	×	×	√	√	√	×	√	√	×	×		
Ethiopia	×	×	×	×	×	×	×	×	√	√	√	√	×	×	×	√	√	×	×		
Gabon	×	×	×	√	×	×	×	√	×	×	×	√	√	√	×	√	×	√	×		
Gambia	×	×	×	√	×	×	×	×	×	×	√	√	×	×	×	√	√	√	×		
Ghana	√	×	×	√	√	√	√	√	√	×	√	√	√	√	√	√	√	√	×		
Guinea	√	×	×	√	√	×	×	×	×	×	×	√	√	√	×	√	√	×	√	√	
Guinea Bissau	√	×	×	√	√	×	×	×	×	×	×	×	×	×	×	√	×	×	√	√	
Kenya	√	×	×	×	√	×	×	√	√	√	√	√	×	√	√	√	√	√	√	√	
Lesotho	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	×	×	×	×	×	
Liberia	√	×	×	√	×	×	√	√	×	×	×	√	√	√	×	√	×	×	×		
Madagascar	√	×	×	√	√	×	×	√	√	√	√	√	√	√	×	√	√	√	√	√	
Malawi	√	√	×	×	×	×	×	√	×	√	√	×	×	×	×	√	√	√	√	√	
Mauritius	√	√	×	×	√	√	×	√	√	√	√	√	×	×	×	×	×	√	×		
Mozambique	√	×	×	×	×	×	×	×	×	√	√	×	×	×	×	√	×	√	√		
Namibia	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×		
Niger	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	×	×	×	×		
Nigeria	√	×	×	√	√	×	√	√	√	×	√	√	√	√	√	√	√	√	√	√	
Rwanda	×	×	×	×	×	×	×	×	×	√	√	×	×	×	×	√	√	×	×		
Sao Tome and Principe	√	√	×	√	×	×	×	×	×	×	×	×	√	√	×	√	√	×	×		
Senegal	√	√	×	√	×	×	×	×	√	×	√	√	×	×	√	√	√	√	√	√	
Seychelles	√	×	×	×	×	×	×	×	×	√	√	√	×	×	×	√	×	√	×		
Sierra Leone	√	×	×	√	×	×	×	×	×	×	×	√	√	√	×	√	√	×	×		
Somalia	√	×	×	×	×	×	×	×	×	×	×	√	×	×	×	√	×	×	×		
Sudan	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	√	×	√	×		
Swaziland	×	×	×	×	×	×	×	×	×	×	×	√	×	×	×	√	×	√	×		
Tanzania	√	×	×	√	×	×	×	×	×	√	√	×	√	√	×	√	√	×	√	√	
Togo	√	×	×	√	×	×	×	×	×	×	√	√	√	√	×	√	√	√	√	√	
Uganda	×	×	×	×	×	×	×	×	×	√	√	×	√	√	×	√	√	√	×		
Zaire	×	×	×	√	×	×	√	×	×	√	×	×	√	√	√	√	√	×	×		
Zambia	×	×	×	×	×	×	×	×	×	√	√	√	×	×	√	√	√	×	√	×	
Zimbabwe	×	√	√	×	×	×	×	√	√	√	√	√	×	×	√	√	√	×	√	×	

1) Cultivation and production undertaken.
2) Basic products exported.
3) Basic products imported.

Source: FAOSTAT, 2001

Appendix 2: A summary of completed World Bank tree crop projects in sub-Saharan Africa since 1974, with dates of analytical reports

Country	Project	Credit or Loan No.	Date of PCR/ICR/PPA/IER
1. Benin	Hinvi Agric. Development Project	Cr. 0144	May 1978 (PPA)
"	Forestry Project	Cr. 1505	June 1992 (PCR)
2. Burundi	Arabica Coffee Improvement Project	Cr.0147	March 1977 (PPA)
"	Second Coffee Improvement Project	Cr. 0593	June 1983 (PCR)
"	Kirimiro Rural Development Project	Cr. 1165	March 1992 (PCR)
"	Third Ngozi Integrated Rural Dev. Project	Cr. 1192	March 1992 (PCR)
"	Coffee Sector Project	Cr. 2123	May 1997 (ICR)
3. Cameroon	Agric. and Oil Palm Projects	Ln. 0490, 0593, 0886. Cr. 0100,1752	Oct 1977 (PPA)
"	Cocoa Project	Ln. 1039	June 1984 (PPA)
"	Rubber and Oil Palm Projects	Ln.1791,1508, 1392,1391 Cr. 0975, 6019	Dec 1988 (PPA)
"	Integrated Rural Development Project	Cr.0776	May 1987 (PCR)
"	Rural Development Projects	Ln. 1919 Cr. 0784, 0776,1075	June 1990 (PPA)
"	Oil Palm and Rubber Consolidation Project	Ln. 2160	March 1991 (PCR)
"	Third Hevecam Rubber Project	Ln. 2485	Dec 1992 (PCR)
"	Cocoa Rehabilitation Project	Ln. 2912	June 1997 (ICR)
4. Comoros	Coconut Rehabilitation and Rodent Control	Cr. 1035	Dec 1992 (PCR)
5. East African Community	Second Dev. Bank Project	Ln. 1204	June 1991 (PCR)
6.Equatorial Guinea	Crop Diversification and Agric. Services Project	Cr. 2181	Oct 1995 (ICR)
7.Ethiopia	Wolomo Agric. Dev. Project	Cr. 0169	June 1979 (PPA)
"	Coffee Processing Project	Cr. 0290	June !982 (PPA)
"	Second Coffee Processing Project and Marketing Project	Cr. 1429	June 1993 (PCR)
"	Agricultural Research Project	Cr. 0290	Dec 1994 (ICR)
8. Ghana	Cocoa Project	Cr. 0205	June 1981 (PPA)
"	Ashanti Region Cocoa Project	Ln. 1181	May 1984 (PCR)
"	Oil Palm Project	Cr. 0531	May 1984 (PPA)
"	Second Oil Palm Dev. Project	Cr. 1498	Dec 1994 (PCR)
"	Agric. Sector Adjustment Credit Project	Cr. 2345	May 1997 (ICR)
"	Cocoa Rehabilitation Project	Cr. 1854	June 1997 (ICR)
9. Côte 'Ivoire	First and Second Oil Palm Projects	Ln. 0611, 0612, 0613, 0760,0754	March 1977 (PPA)
"	Cocoa Project	Ln. 0686	Feb 1978 (PPA)
"	Third Oil Palm Project	Ln. 1036	June 1980 (PPA)
"	Fourth Oil Palm and Coconut Project	Ln. 1382	Dec 1981 (PPA)
"	First, Second, Third and Fourth Oil Palm & Coconut Projects	Ln. 0611, 0612, 0613, 0760, 0759	May 1984 (IER)
"	Second Cocoa Project	Ln. 1069	June 1984 (PPA)
"	Centre West Agric. Dev. Project	Ln. 2167	Nov 1993 (PCR)
"	Fifth Oil Palm Dev. Project	Ln. 2627	Jan 1996 (ICR)
"	Agricultural Sector Adjustment Credit	Cr. 3224	June 1999 (ICR)
10. Kenya	Smallholder Tea Dev. Project	Cr. 0064	March 1974 (PPA)
"	Second Kenya Tea Development Authority Project	Cr. 0119	Aug 1975 (PPA)
"	Second Smallholders Agric. Credit Project	Cr. 0344	June 1979 (PPA)
"	Group Farm Rehabilitation Project	Cr. 0537	June 1985 (PPA)
"	Tea Factory Project	Ln. 0993	June 1987 (PPA)
"	Smallholder Coffee Improvement Project	Cr. 0914	Dec 1989 (PPA)

11. Liberia	Lofa County Agric. Dev. Project	Cr. 0577	May 1983 (PCR)
"	Bong County Agric. Dev. Project	Cr. 0700	Oct 1984 (PCR)
"	Second Lofa County Agric. Dev. Project	Cr. 1242	May 1991 (PCR)
"	Decoris Oil Palm Project	Ln. 1765	May 1991 (PCR)
"	Second Bong County Agric. Dev. Project	Cr. 1447	April 1992 (PCR)
12.Madagascar	Agricultural Credit Project	Cr.1064	May 1989 (PCR)
13. Mauritius	Mauritius Tea Development Authority project	Cr. 0239	Jan 1982 (PPA)
14.Mozambique	Agricultural Rehabilitation and Dev. Project	Cr. 2175	June 1999 (ICR)
15. Nigeria	Western State Cocoa Project	Ln. 0764	Jan 1978 (PPA)
"	Second Cocoa Project	Ln. 1045	June 1982 (PPA)
"	Oil Palm Projects	Ln. 1183, 1192	Nov 1983 (PPA)
"	Oil Palm Projects	Ln. 1191, 1591	June 1989 (PCR)
"	Tree Crops Project	Ln. 3126	Dec 1996 (ICR)
16. Rwanda	Mutura Agric. Devt. Project	Cr. 0439	June 1982 (PPA)
"	Lake Kivu Coffee Improvement & Food Crop Project	Cr. 1126	Nov 1993 (PCR)
"	Bugesera Gisaka Mogongo Rural Services (Phase II) Project	Cr. 1283	Dec 1993 (PCR)
17. Sao Tome & Principe	Cocoa Rehabilitation Project	Cr.1830	Nov 1993 (PCR)
18. Sierra Leone	Integrated Agric. Development Project	Cr. 0323	May 1978 (PPA)
"	2nd Integrated Agric. Development Project	Cr. 0568	June 1983 (PPA)
"	3rd Eastern Integrated Agric. Development Project	Cr. 1094	Dec 1990 (PCR)
"	2nd Northern Integrated Agric. Dev. Project	Cr. 1128	Dec 1994 (PCR)
19. Somalia	Northwest Region Agric. Development Project	Cr. 0635	Nov 1992 (PCR)
"	Bay and Northwest Regions Agric. Dev. Project	Cr. 0972, 0635,1538	Dec 1993 (PPA)
20. Sudan	Southern Region Agric. Rehabilitation Project	Cr. 0476	May 1981 (PPA)
21. Tanzania	Program Loan Project	Ln. 1063	Dec 1976 (PPA)
"	Smallholder Tea Development Project	Cr. 0287	Dec 1979 (PPA)
"	Agric. Products Rural Development Projects	Cr. 0802, 0454, 0606, 0658, 0703	June 1984 (PPA)
"	Investment Bank Projects	Ln. 1745, 1750, 1172, 1498	May 1989 (PPA)
"	Second Cashew nut Development. Project	Cr.0801	May 1990 (PCR)
"	Smallholder Tea Consolidation Project	Cr. 1037	April 1990 (PCR)
"	Coconut Pilot Project	Cr. 1070	May 1990 (PCR)
"	Agricultural Products Projects	Cr. 0801, 1037, 1070, 1007	Dec 1990 (PPA)
"	Agricultural Sector Adjustment Credit	Cr. 2116	Dec 1994 (PCR)
21. Tanzania	Program Loan Project	Ln. 1063	Dec 1976 (PPA)
"	Smallholder Tea Development Project	Cr. 0287	Dec 1979 (PPA)
"	Agric. Products Rural Development Projects	Cr. 0802, 0454, 0606, 0658, 0703	June 1984 (PPA)
"	Investment Bank Projects	Ln. 1745, 1750, 1172, 1498	May 1989 (PPA)
"	Second Cashew nut Development Project	Cr.0801	May 1990 (PCR)
"	Smallholder Tea Consolidation Project	Cr. 1037	April 1990 (PCR)
"	Coconut Pilot Project	Cr. 1070	May 1990 (PCR)
"	Agricultural Products Projects	Cr. 0801, 1037, 1070, 1007	Dec 1990 (PPA)
"	Agricultural Sector Adjustment Credit	Cr. 2116	Dec 1994 (PCR)
"	Cashew and Coconut Tree Crops Project	Cr. 2050	May 1998 (PPA) March 1997 (ICR)
22. Togo	Cocoa-Coffee Development Projects	Cr. 0503	June 1983 (PPA)
"	Rural Development Projects	Cr.0741, 0638	June 1984 (PPA)
"	2nd Structural Adjustment Program Project	Cr. 1599	June 1990 (PPA)
"	2nd Cocoa-Coffee Development Project	Cr. 0945	June 1990 (PCR)
23. Uganda	Tea Growers Corporation Project	Cr. 0109	March 1979 PPA)
"	Agricultural Rehabilitation Project	Cr. 1328	Dec 1993 (PCR)

24. Burkina Faso	2nd Bougouriba Agric. Development Project	Cr. 1097	Oct 1990 (PCR)
25. Zambia	Coffee Production Project	Cr. 0863	April 1988 (PCR)
"	Second Coffee Project	Cr. 1743	June 1997 (ICR)

1 PCR = Project Completion Report ICR = Implementation Completion Report
PPA = Project Performance Audit IER = Implementation Evaluation Review

Appendix 3 Tree Crop Development Models Utilised To Date

1. General

A wide range of models has been used throughout the tropics for the development of smallholder tree crops. Some of these have been utilised in Sub-Saharan Africa. Details of seven development models involved are provided below.

2. Outline details of smallholder tree-crop development models: strengths and weaknesses

(a) Government Assisted Smallholder Land Schemes

In Malaysia, there were three government-assisted and centrally managed smallholder land schemes involving the new planting or replanting of tree crops. These three schemes; RISDA, FELDA and FELCRA all achieved high degrees of technical success, but tended to be expensive per family and per unit area of land developed. Grant and credit support were afforded to smallholders. Similar arrangements were utilised in East Africa for tea development projects such as KTDA.

(b) Estate and Smallholder (NES) Model

This development model was first used in Papua New Guinea, where it was utilised to promote oil palm development. The nucleus estates were generally Government owned but commercially managed, and the smallholders were partly resettled farmers and partly "outgrowers", who planted oil palms on their own land holdings.

The NES system was imported into Indonesia and various countries of Sub-Saharan Africa, and has been utilised for a range of crops including oil palms, rubber, cocoa, coffee, tea and sugar, and the smallholder component was limited to resettled farmers (i.e. there were no outgrowers). The nucleus estates have been either Government-owned or privately owned.

This model has been widely used and has enjoyed mixed success. Placing overall management of smallholder blocks, housing and other infrastructure in the hands of estates often meant the over-stretching of management capabilities, and financial resources. Over-bureaucratisation also sometimes led to lack of timeliness in field operations, and creation of sub-standard plantings. This is a high-cost approach, which involves a large credit component for participants, and land titling. Credit recovery has often proved difficult. This development model has proved to be most successful with oil palms.

Linked to this are contract farming and outgrower *schemes*. Both tree crop export chains and domestic processing industries can benefit from these types of contractual arrangements. For farmers, amongst other things, the benefits include provision of inputs (often on credit), extension and advice, and a guaranteed market outlet. However, problems with strategic default are common where farmers have several options for selling the produce after harvest (Coulter, et al, 1999).

(c) Resettlement Blocks Without a Nucleus Estate in Indonesia

This pattern of smallholder tree crop development contained the basic ingredients of the NES system, but without the nucleus estate. Project management provided all necessary services for the development of high quality tree crops and all associated

housing and infrastructure. Processing facilities were usually also provided nearby or within reach. The North Sumatra Smallholder Development Project is an example of this model in Indonesia, and it has been widely utilised elsewhere. It is similar to some of the Malaysian smallholder land schemes.

This model has had mixed success, is also high cost, and involves a large credit component and land titling. Greatest success has been achieved where management of smallholder areas was rigid and where blocks were handed over to their eventual owners towards the end of immaturity.

(d) Smallholders on Their Own Land-Project Management Units (PMUs)
Under this pattern of smallholder tree crop development, which has been widely used in Indonesia, existing farmers undertake credit-based replanting or new planting on their own land in a focussed manner under the guidance of local Project Management Units, which are in turn coordinated on a central basis. The only infrastructure provided relates to the provision of PMU services. No processing facilities are provided.

These PMU-style projects in Indonesia have been remarkably successful where adequate and timely funding have also been available. Under such projects, rationally consolidated blocks of various perennial crops are developed under moderately scaled management teams without the assistance or intervention of nucleus estates. Technical standards have been high under many PMU projects, with direct development costs being some sixty percent lower than in NES projects.

PMU-led projects for tree crop smallholders on their own land in Indonesia have also been remarkably successful in technical terms, by virtue of simplicity of design, good training and dedicated efforts by core staff members.

Success has sometimes been impaired where projects were over-ambitious, spread over too many geographical locations and where excessive emphasis was placed on intercropping, with resultant encroachment by *Imperata cylindrica (alang-alang* grass*)*.

Credit recovery has been problematic in some cases, because of the unwillingness of development banks to become actively involved. Whereas the pure PMU system involved credit-supported provision of essential tree crop inputs up to crop maturity, a government-funded version (PRPTE), provided for inputs for only the first two years of crop life, and was technically far less successful.

(e) Cess-Funded Schemes
A cess-funded rubber-replanting scheme in Thailand, which is managed by ORRAF, has been remarkably successful in technical and economic terms. Over-rapid exploitation of young replanted trees has nonetheless placed severe cash-flow burdens on ORRAF, as farmers (who quite rightly feel that they wish to accelerate their own cash flow), return for new replanting grants when trees require replacement at 16 rather than the planned 25 years of age.

(f) Smallholders on Their Own Land-Partial Approach

Under this model of tree crop development, which was initiated in the early 1990s in Indonesia, assistance is given to smallholders to develop estate crops on their own land, but with that assistance being limited to an initial one-year period.

This development model involves no credit. Grant assistance is provided in respect of labour and material inputs for the first year of field development, including provision of good quality planting material. Inputs are also often provided for one or two food cropping cycles. No formal assistance is provided thereafter, in terms of inputs. All inputs and coordination of agricultural operations are provided through appropriately procured contractors.

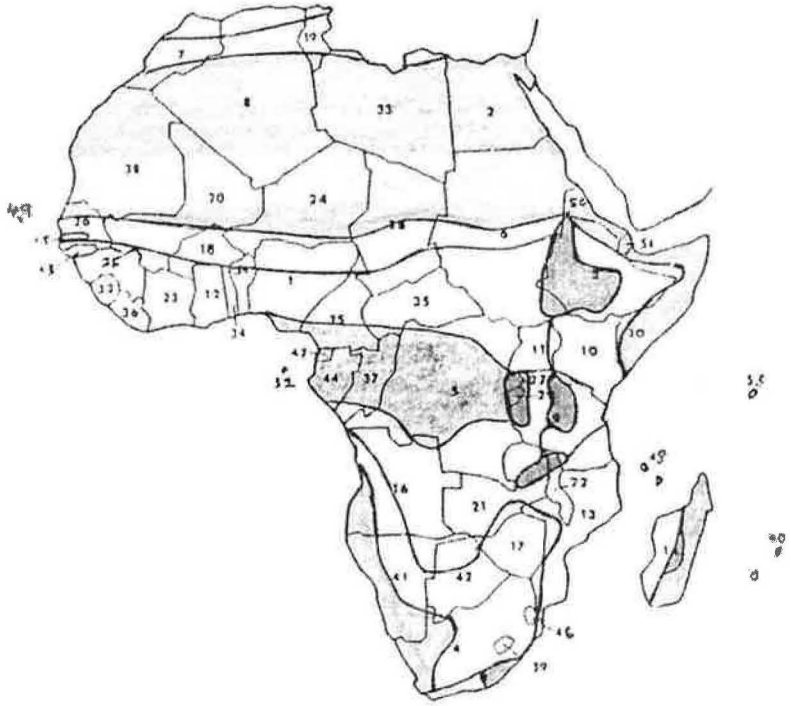
This model is widely used throughout poorer rural areas in Indonesia and has enjoyed very mixed success, mainly because of difficulties in ensuring provision of inputs in a timely manner during the grant- assisted initial development year, and the lack of follow-up field maintenance in the subsequent years leading up to crop maturity. The model has some scope or improvement in the technical and organisational senses, through the utilisation of development-oriented contractors working in association with motivated farmers' groups, who wish to enter into a mutually beneficial business arrangement with the contractor.

(g) Smallholders on Their Own Land-Dispersal Approach
Another scheme for tree crop development, which is known as the Dispersal Approach, has been tried on a pilot scale for rubber in Indonesia. The aim is to assist progressive farmers through provision of good quality planting material, and access to processing facilities and basic extension services. No formal credit or grants are involved.

Under this system and with only nominal Government support, budwood and planting material have been produced by private rubber processors for sale to farmers who are already providers of raw rubber to the factories. The supply of planting material at cost is, in due course, to be supplemented by basic extension services through small PMUs and provision of other vital inputs. It is estimated that some eighty percent of rubber farmers in Indonesia have been untouched by focussed rubber schemes: it is such farmers who could stand to benefit from the Dispersal Approach.

Appendix 4: Maps

Figure 1 The Climatic Regions of Africa

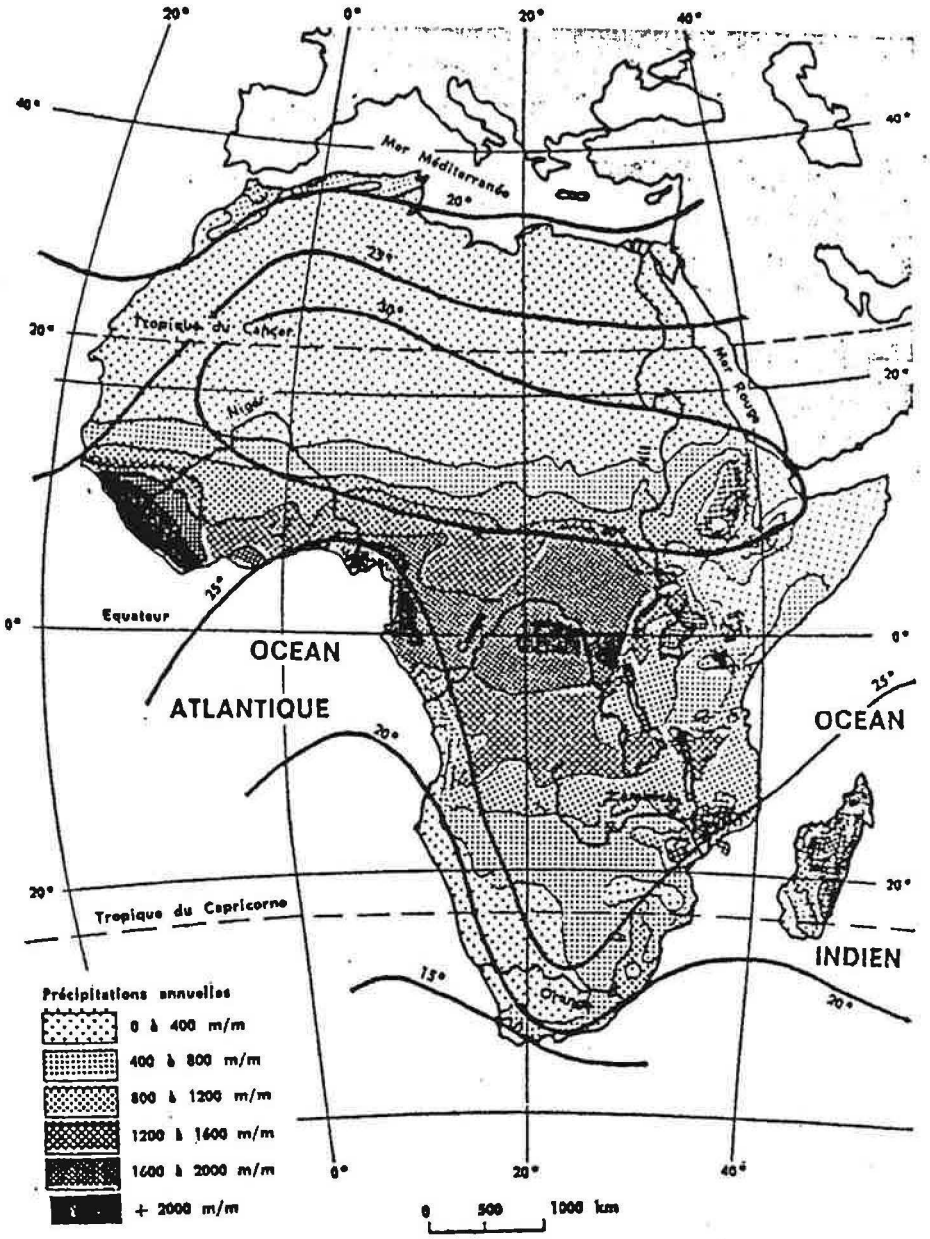


Key:

- Rainy Tropical Climate: At most, one or two dry months, all months warm or hot
- Wet and Dry Tropical Climate: A well developed dry season with one or two rainy seasons; all months warm or hot
- Semi-Arid Tropical Climate: Light precipitation, rapid evaporation; all months warm or hot
- Hot Arid Climate: Negligible precipitation, rapid evaporation; all months warm or hot
- Humid Sub Tropical Climate: Precipitation in all seasons with maximum in summer; long warm summers, cool winters
- Dry Sub Tropical Climate: Hot dry summers; cool, moderately rainy winters
- High Altitude Climates: Climate varies with elevation, altitude and exposure

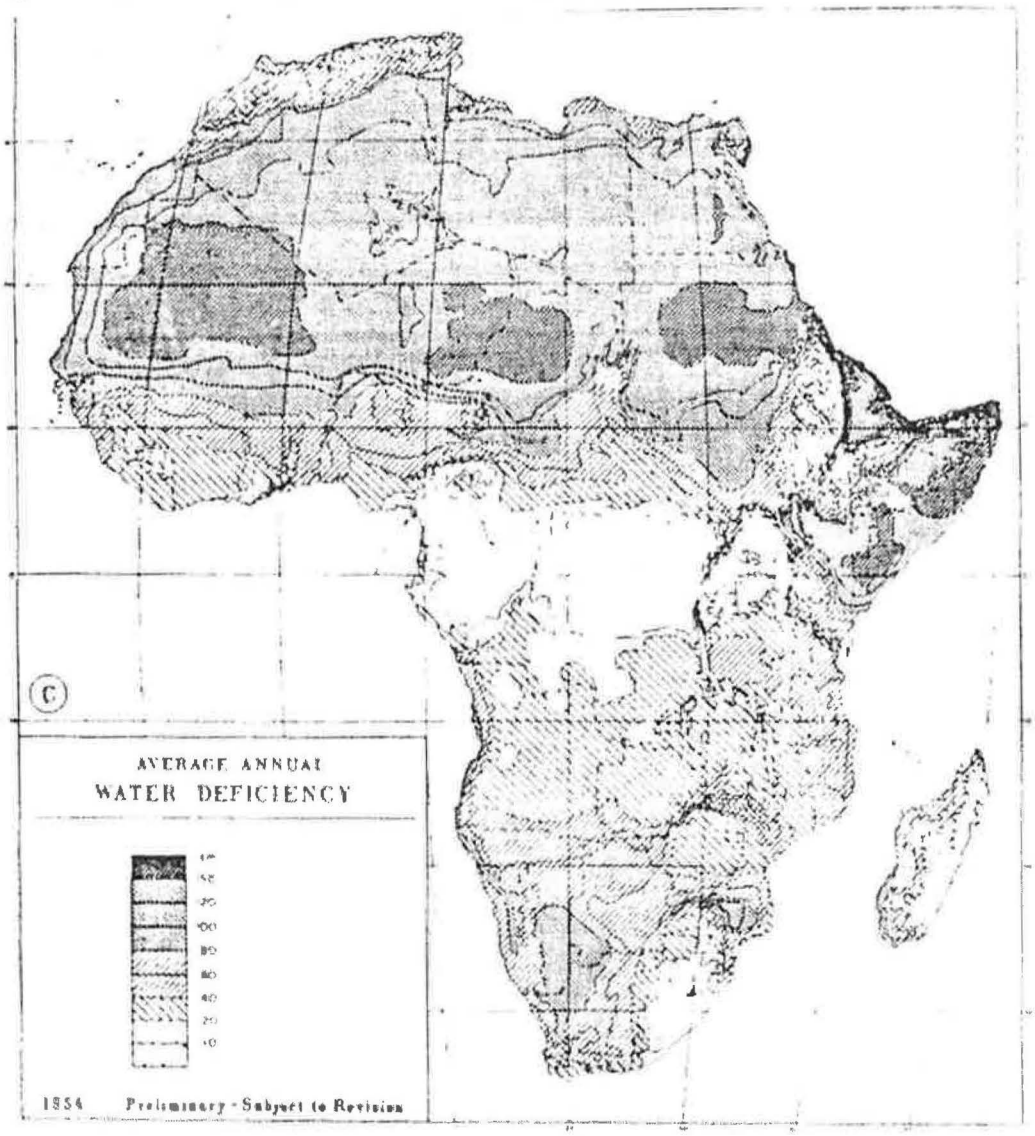
Source: Encyclopaedia Britannica Atlas

Figure 2 Africa: Average Annual Temperatures and Rainfall Totals



Source : Memento de l'Agronome – French Ministry of Cooperation

Figure 3 Africa: Average Annual Water Deficits



Source : Agricultural Compendium. Elsevier 1981

Figure 4 Africa: Soil Groups

Key:

Desertic Soils of Arid Climates; including many areas of shallow, stony soils; sparse cover of shrubs and grass, some suitable for grazing; fertile if irrigated; dry farming possible in some areas

Latosolic Soils of Humid or Wet-Dry Tropical and Subtropical Climates; supports forest or savanna; shifting cultivation with some plantation agriculture

Chernozemic Soils of Semi Arid, Cool to Tropical Climates; supports mainly grasslands; extensive grain and livestock farming

Mountain Soils of All Climates; shallow, stony; barren, grass covered, or forested, depending on climate; includes many areas of other soils

Grumosolic Soils of Humid to Semi Arid and Temperate to Tropical Climates, with Distinct Wet and Dry Seasons; mainly grass covered; livestock and grain farming

Alluvial Soils of All Climates; intensive farming

Source: Encyclopaedia Britannica Atlas

Appendix 5 . Criteria Utilised in the Evaluation of Land Characteristics for rubber

Characteristic	*Degree of Limitation*				
	Not Limiting (S1)	*Minor* **(S2)**	**Moderate (S3)**	**Serious (N1)**	**Very Serious (N2)**
Evaluation of Land Characteristics for		*Rubber Group (1)*			
Climate					
Annual Rainfall (mm)	2,000-3,000	3,000-4,500 1,700-2,000	4,500-5,000 1,500-1,700	5,000-6,000 1,200-1,500	+6000 -1,200
Dry Season (months)	1	2	3-4	5	6
Mean Annual Temp (°C)	26-28	28-30 24-26	30-33 22-24	33-35 20-22	+35 -20
Topography					
Slopes (%)	0-12	12-24	24-38	38-50	+50
Wetness					
Drainage	Well	Moderately well	Imperfect	Poor (Aeric)	Poor (Typic.) Very Poor
Flooding	Never Flooded	-	Minor	Moderate	Severe
Physical Soil Condition					
Texture/structure	CL, Co, SC, Cs	SiCs, SCL, L	SL, LSf	Lsco, Cm, SiC	S
Depth (cm)	+150	100-150	50-100	25-50	-25
Depth to Sulfuric Horizon (cm)	+150	100-150	50-100	25-50	-25
Thickness of Peat (cm)			-50	50-150	
Soil Fertility Conditions					
Weathering Stage (CEC/clay)	+16	-16			
Base Saturation (%)	+35	-35	-20		
PH	4.50-5.5	5.5-6.5	6.7-7.5	7.5-8.5	>8.5
Salinity (mmhos)	-1	-	1-2	2-4	+4