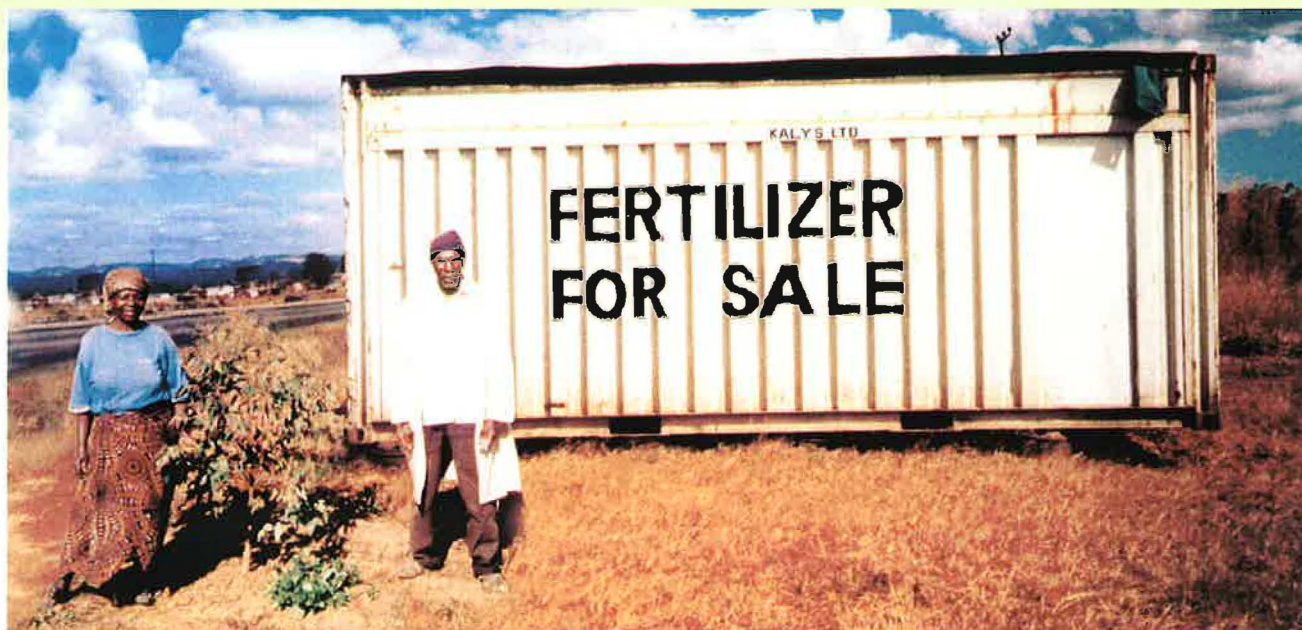


Soil Fertility Management and Sustainable Livelihoods:

New Approaches to the Policy Process

Part I: Country Reports



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**SOIL FERTILITY MANAGEMENT AND
SUSTAINABLE LIVELIHOODS:
NEW APPROACHES TO THE POLICY PROCESS**

PART I: COUNTRY REPORTS

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SECTION 1

INTRODUCTION AND SCOPE OF REPORT

BACKGROUND AND OBJECTIVES

This report presents the outputs from the first phase of a study commissioned as a result of the UK Department for International Development's (DFID) interest in contributing to policy debate on soil fertility management in Sub Saharan Africa. This work originally envisaged consideration of appropriate engagement with global initiatives, specifically the Soil Fertility Initiative (SFI) for Sub Saharan Africa, launched in 1996 by the World Bank. Subsequent to the work being commissioned it became apparent that the SFI was in a state of evolution and while discussions were held with various organisations it is considered that it is no longer appropriate to include these within this report.

The primary focus of the study has been on lower levels in the policy process within seven countries representing a range of ecological, economic and political conditions. This focus on specific countries recognises that while global initiatives have a contribution in terms of raising the profile of soil fertility as an issue that should concern governments and development agencies, solutions and options for addressing soil fertility in the context of poor people's livelihoods require a more location specific approach. A major challenge explored by the country studies is how best to foster a process whereby policy and thinking at higher levels is informed by and responsive to more local level knowledge, interests and capacity.

PLANNED OUTPUTS

Phase I, which ran from March to July 1999, was designed to generate four outputs:

- 1. A concise summary of SFI objectives, approaches and achievements, with an assessment of the advantages and opportunities for greater UK participation in the SFI and of the scope for contributing to the SFI agenda and country action plans (in the context of DFID's support for sustainable agriculture in the wider livelihoods context)
- 2. Concise reviews of six priority sub Saharan African countries, covering the soil fertility management context, related activities, initiatives, and policies, and the scope for more policy dialogue linking local and national levels.
- 3. A framework for future partnership between UK organisations and those from selected African countries (also addressing potential opportunities for collaborative links with other European organisations and CGIAR programmes)
- 4. A revised proposal for a Phase II of the project, building on the above outputs and taking full account of the views and priorities of in-country African partners.

ACTIVITIES UNDERTAKEN

Collection of background information and dialogue The project began in March 1999 with assembly and review of available documentation on the Soil Fertility Initiative and on soil fertility issues and initiatives in the six countries initially selected for the study (Mali, Nigeria, Ethiopia, Kenya, Malawi and Zimbabwe). Contact was established with stakeholders in the countries.

Country visits. Between March and June short visits were made to each country. This included a visit to Zambia, which was included in view of the relatively advanced stage of its SFI plan, and the opportunity to explore soil fertility related policy issues arising from the rapid post-liberalisation expansion of out-grower and contract farming schemes. Within each country, team members collected documentation and consulted with a range of stakeholders, in government, NGOs, CGIAR programmes, donors, and the private sector. Discussions focussed on the extent and causes of soil fertility decline, on current initiatives to promote improved soil fertility management, and on the need for and possible means of improving local co-ordination and feedback to policy makers.

Visit to FAO. Two members of the team also visited Rome near the start of the project, to discuss with relevant officials in FAO. The focus of this visit was to address output 1, and in general the team was able to discuss FAO's experiences with the SFI up to that time and its views on the policy process.

Report drafting and circulation Country visits were followed by the drafting of a discussion document for each country, containing a review of the major economic, political and natural events and issues affecting farm level soil fertility management. For most of the countries visited, it was possible to circulate the draft discussion document and obtain comments from within the country. Draft reports were also circulated within the team and comments exchanged. Revisions were made to these reports in the light of feedback, and these reports comprise the meat of this report, which is Section 2.

UK collaborator meeting At the end of June, the UK collaborator team met at IIED in order to exchange experiences and identify ways of carrying the process forward. The meeting identified both differences between the countries in soil fertility policy related needs and processes and issues common to all of the countries. This pooling of experiences and ideas for the future has contributed to the production of an outline concept note, which is published as the second volume of this report. The concept note (combining outputs 3 and 4) outlines a way to tie together crosscutting threads into a set of activities which build on the priorities defined by partner organisations in the different countries.

FINDINGS

The UK collaborator meeting identified considerable variation between the countries in terms of levels of on-going activities relating to soil fertility management research and linked development and policy activities. In some countries (notably Kenya, Zimbabwe and Malawi) existing soil fertility networks were effectively linking many of the key stakeholders, particularly on the side of technical research. In the other countries (particularly Nigeria, Mali and Ethiopia), such strong networks were not in evidence, and there was greater expressed need for applied and adaptive research linked to development in order address emerging soil fertility problems, particularly in the marginal and remoter areas. In spite of these differences, three threads of common concern emerged across the countries visited.

Firstly, input supply and output markets for soil fertility linked technologies in the post-liberalisation context are a major constraint to improving smallholder soil fertility management and livelihoods particularly in remote and marginal areas.

Secondly, more effective technology development and extension approaches for integrated soil fertility management are needed, so that poorer smallholders can readily access new knowledge and technology, and be encouraged to look beyond short-term payoffs.

Thirdly, processes of political decentralisation underway in the countries visited present new opportunities for local level policy development in order to address issues of natural resource sustainability (of which soil fertility management is an important component). All three issues are particularly pertinent to smallholders staying in the remoter and more marginal areas, which have agricultural potential but which have been negatively affected by liberalisation and market failure.

SECTION 2

COUNTRY REPORTS

**ETHIOPIA
KENYA
MALI
NIGERIA
MALAWI
ZAMBIA
ZIMBABWE**

SOIL FERTILITY MANAGEMENT REVIEW COUNTRIES

MALI

Population: 10 million
Surface area: 1,220 thousand square kilometres
Cropland as a % of surface area: 3%
Population density: 8 people per square km
% Urban population: 28%
Human Development Index ranking: 171 (of 175)
Net food security situation (value of imports of food): US\$ 109mn
Exports of agricultural produce (value of exports of produce): US\$ 276mn
Political summary: Multi-party elections held in 1992 and 1997 were won by the party of Alpha Konaré, which has followed pro-market economic policies. It is currently in the process of decentralising its administration to newly elected local government authorities at commune level, and is reviewing its land tenure code.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for the SFI, although not for DFID.

NIGERIA

Population: 118 million
Surface area: 911 thousand square kilometres
Cropland as a % of surface area: 36%
Population density: 122 people per square km
% Urban population: 41%
Human Development Index ranking: 142 (of 175)
Net food security situation (value of imports of food): US\$ 1,219mn
Exports of agricultural produce (value of exports of produce): n/a
Political summary: Political transition culminating in civilian rule. Economic and social reforms will take longer to achieve. High priority is being given to strengthening the role of Local Governmental Authorities. However, power largely remains in the core.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for the SFI and DFID.

ZIMBABWE

Population: 11 million
Surface area: 387 thousand square kilometres
Cropland as a % of surface area: 8%
Population density: 28 people per square km
% Urban population: 33%
Human Development Index ranking: 130 (of 175)
Net food security situation (value of imports of food): US\$ 71mn
Exports of agricultural produce (value of exports of produce): US\$ 608mn (tobacco)
Political summary: The ruling ZANU party of Robert Mugabe is currently under significant public pressure, with price increases on basic foods and utilities leading to demonstrations. Land redistribution remains a volatile issue. The government has sought to deal with pressures by forming the National Economic Consultative Forum which brings all the major stakeholders together to discuss and make recommendations on issues including land reform, prices and wages, and poverty.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for DFID, although not for the SFI.

ZAMBIA

Population: 9 million
Surface area: 743 thousand square kilometres
Cropland as a % of surface area: 7%
Population density: 12 people per square km
% Urban population: 44%
Human Development Index ranking: 146 (of 175)
Net food security situation (value of imports of food): US\$ 10mn
Exports of agricultural produce (value of exports of produce): n/a
Political summary: Mr Chiluba's MMD has been in power since 1991 and has initiated an economic reform program aimed at diversifying and expanding the country's economic base and by increasing agricultural production. Since 1992, market-oriented economic reforms have eliminated subsidies, reduced import tariffs, liberalized crop marketing and decontrolled prices.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for DFID and the SFI.

ETHIOPIA

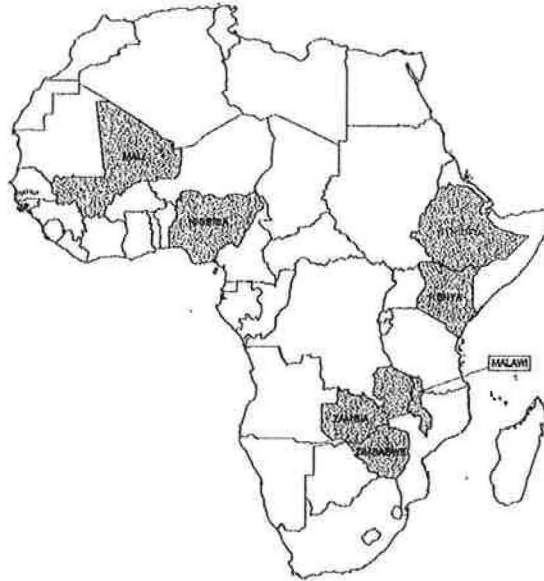
Population: 60 million
Surface area: 1,000 thousand square kilometres
Cropland as a % of surface area: 12%
Population density: 104 people per square km
% Urban population: 6%
Human Development Index ranking: 169 (of 175)
Net food security situation (value of imports of food): US\$110 mn
Exports of agricultural produce (value of exports of produce): US\$412 mn
Political summary: Ethiopia is in transition from a command- to a market based economy, represented by the lowering of the tax rate and dismantling of most price controls. It has a mixed farming economy, with 67% of export earnings coming from coffee.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for the SFI and for DFID.

KENYA

Population: 28 million
Surface area: 569 thousand square kilometres
Cropland as a % of surface area: 8%
Population density: 47 people per square km
% Urban population: 30%
Human Development Index ranking: 137 (of 174)
Net food security situation (value of imports of food): US\$ 252mn
Exports of agricultural produce (value of exports of produce): US\$ 300mn (coffee)
Political system: President Moi (in office since 1978) completes his constitutional limit of two terms in 2002. Kenya's economy is reasonably diversified in terms of GDP, but most employment is dependent on agriculture, contributing 29% of GDP. However, the GDP growth rate has declined below the that of the population in the 1990s.
Country selection characteristics: Contains high and low resource pressure areas and is a priority country for the SFI and for DFID.

MALAWI

Population: 10 million
Surface area: 94 thousand square kilometres
Cropland as a % of surface area: 18%
Population density: 104 people per square km
% Urban population: 14%
Human Development Index ranking: 161 (of 175)
Net food security situation (value of imports of food): US\$ 53mn
Exports of agricultural produce (value of exports of produce): US\$ 406mn
Political summary: The first multiparty elections were held in 1994 and bought Bakili Muluzi to power. This government, which has initiated an economic reform agenda, faces challenges on several fronts, among them a rapidly growing population, inequality that has resulted from years of an elitist development strategy, poor management of limited natural resources, and the effects of recurring droughts and environmental degradation.
Country selection characteristics: Contains high resource pressure areas and is a priority country for the SFI and for DFID.



Data Sources:
World Bank
World
Development
Report, data
from 1997

UNDP Human
Development
Index, 1998
Report Authors

General Introduction

The following seven country reports present preliminary findings following visits by different representatives of the joint programme during the first six months of 1999. The objectives of the visits were to consult with key stakeholders in each country and assess the feasibility and desirability of follow up work on the theme of soil fertility and sustainable livelihoods.

The following are the major objectives of this Phase I project:

- ❑ summarise current issues and initiatives in soil fertility management in relation to rural livelihoods in the selected country,
- ❑ assess the extent of and mechanisms for information exchange on farm level soil fertility management options,
- ❑ test the hypothesis that a major challenge in soil fertility management is to establish processes and mechanisms to ensure that policy and thinking at higher levels is informed by and responsive to more local level knowledge, interests and capacity,
- ❑ explore potential interest, capacity and modalities for the development of collaborative action research proposals to investigate means of improving linkages in policy formulation and implementation.

SECTION 2
COUNTRY REPORTS

ETHIOPIA

2.1 ETHIOPIA

Ian Scoones and James Keeley

A number of different individuals were consulted during the June 14-24th 1999 visit (see Appendix 1) and a number of key documents were identified (see appendix 2). This consultation built on previous contacts made under previous collaborative research and networking projects in Ethiopia. These included: The dynamics of soil fertility (EU funded; partner FARM-Africa), Sustainable Livelihoods Programme (DFID funded; various partners), NUTNET (NEDA funded; partner SOS-Sahel); ISWC (Indigenous Soil and Water Conservation) (NEDA funded; partner Mekelle University College).

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Rural livelihoods in Ethiopia are highly differentiated. A number of different farming systems characterise different parts of the country. These include both high and low potential highland cereal farming areas (with wheat, barley, teff, maize dominating the cropping system); perennial and root crop areas (with enset, coffee and various root crops being important); and pastoral and agropastoral areas (where livestock are a particularly important part of the system). Generalisations at a country level are therefore highly problematic due to the diversity of systems present. For this reason site specific analysis of livelihoods and farming systems are essential. Unfortunately for many areas information remains inadequate. While a considerable amount is known about the higher potential areas and some of the cash cropping zones, relatively little research has been carried out in lower potential agricultural and pastoral areas.

At a national level rural poverty and food insecurity remain key issues. Recent work has shown the widespread nature of rural poverty. This is focussed in certain regions, although social differentiation even within the higher potential zones means that rural poverty and insecure livelihoods is a significant factor. Annually significant amounts of food aid are distributed, with major crisis periods (such as 1984-85) being particularly undermining of rural livelihood strategies. Issues of food production and food security therefore dominate the national policy debate (see below).

Given the small land holdings of the majority of farmers in Ethiopia (many are below 1 ha per household), agricultural production is only one component of a wider portfolio of livelihood activities. Rural trading, craft work, labouring, employment on state farms, migration to towns and so on are just some examples of a huge array of livelihood diversification activities. Most households therefore follow a range of different activities – differentiated by gender and age – in the pursuit of their livelihoods. These change both seasonally and interannually depending on the success of agricultural production, and wider shifts in socio-economic and policy factors.

Environmental concerns – and particularly the conservation of soils - have long been linked to the question of food security (see below). There is widespread consensus that soils management is a major issue for rural livelihoods, both in terms of conservation and erosion control and in terms of soil fertility management. The topography of much of the farmed area of Ethiopia means that erosion risk is always high. Despite the range of both indigenous and externally designed measures, erosion in some places is evident. The relatively limited availability of organic sources of fertility (either in terms of available plant biomass or manure) due to high population densities and the use of manure for fuel in many parts of the northern highlands, means that the importation of nutrients from outside the system (in the form of inorganic fertilisers) is important in many areas.

SOIL FERTILITY MANAGEMENT INTERVENTIONS

There has been a long history of intervention in soil management in Ethiopia. This has followed two major tracks – one focussing on soil conservation and the other focussing on the supply of fertilisers.

While a range of soil conservation interventions had been initiated in previous decades, it was following the FAO sponsored Ethiopian Highland Reclamation Strategy of 1986, that concern heightened. This drew on on-going work by the Swiss sponsored Soil Conservation Research Programme based in the Ministry of Agriculture which had studied rates of soil erosion in a number of sites in the country using both catchment and plot based assessment techniques. The EHRS report highlighted in particular the potential impacts of soil erosion on agricultural production in the highlands, with dramatic projections of what might happen if nothing was done. This attracted the attention of both the government and donors, and prompted the initiation of large-scale soil conservation programmes supported by food-for-work (particularly via WFP) during the 1980s. These programmes included the building of large numbers of terraces, reforestation programmes and hillside closures. Following the fall of the Derg regime in 1991, many of these structures were destroyed by peasants who had resented their imposition. Since then government programmes have not emphasised soil conservation as much as in the past, although packages exist under the new extension programme (see below). Much NGO work since the 1984-95 famine, however, has linked soil conservation and afforestation to a variety of food for work and employment based safety net schemes in different parts of the country.

Attempts to boost agricultural production through the application of inorganic fertilisers have had a long history in Ethiopia, dating back to the early efforts by FAO in the late 1960s. Since then a series of integrated rural development programmes and extension package programmes have had the supply of inorganic fertilisers at the centre of their approach. The Chilalo Agricultural Development Unit (CADU), funded by SIDA, with a project cost of \$19.3m, was the first integrated rural development programme in Ethiopia. It ran from 1967 to 1975, providing a wide range of agricultural services alongside Green Revolution inputs. It was followed by the Wolamo Agricultural Development Unit 1970-80, funded by the World Bank. A parallel initiative was the Minimum Package

Programme, providing improved seeds and fertiliser on credit, running from 1970 to 1976, and in a smaller second phase until 1984, funded by the World Bank and SIDA. These programmes were followed by Peasant Agricultural Development Programmes (PADEPs) in different agroecological zones - though largely concentrating on dissemination of Green Revolution technologies in high-potential areas. These ran from 1987 with World Bank and EU funding. Today this focus is at the centre of the government's extension strategy, PADETES (Participatory Demonstration and Training Extension System). This strategy was launched in 1996 following piloting activities supported by the international NGO, Sasakawa Global 2000. The PADETES approach combines elements of the World Bank Training and Visit system with demonstration on 0.5ha of a fertiliser-improved seeds package supported by credit. This programme has expanded enormously over the last few years with around 4 million farmers expected to be involved in the 1999 season. While this approach has boosted yields considerably in the higher potential zones in good rainfall years and among farmers with the ability to cover the credit terms, the prospects for increasing production through fertiliser and improved seeds technical interventions in more marginal areas is being questioned.

These two themes – soil conservation and fertiliser inputs – have been supported by a wide array of Ethiopian research over the years. For example, the Institute of Agricultural Research (now EARO, the Ethiopian Agricultural Research Organisation) has carried out numerous crop-fertiliser trials in different parts of the country, alongside the extensive FAO supported fertiliser testing programme carried out by the National Fertiliser and Inputs Unit (NFIU) between 1986 and 1996. Moves are afoot to develop more area and crop specific recommendations under new work planned under the auspices of the National Fertiliser Industry Association and the World Bank National Fertiliser Sector Project. Soil erosion and conservation issues have also received much research attention. As already noted the Ministry of Agriculture's SCRP collected considerable quantities of data on soil erosion in seven sites between 1981 and 1998. Soil classification and mapping exercises are also now planned under new work being proposed by EARO.

However much research has maintained a fairly narrow technical focus. Although work on agroforestry, organic matter management, composting etc. exists, this has been relatively limited, although new work – for example under the ICRAF supported African Highlands Initiative – may redress this problem. Most work also has failed to look at soils problems in a broader livelihoods context, although a certain number of farming systems and rapid rural appraisal studies have been carried out in different parts of the country (for example, FARM-Africa projects in Southern Region and Tigray). More detailed socio-economic and policy studies which explore the interaction between soils management and rural livelihood issue have been even rarer, although work co-ordinated by FARM-Africa on the dynamics of soil management in Wolayta and ILRI/IFPRI work on land tenure and soils management had significant socio-economic and policy components (Worku,1998). Overall though, the result has been a concentration on technical responses to perceived problems through externally generated solutions. This has often ignored the extensive local farmer knowledge of soil conservation and fertility management practices.

Despite the now widely accepted critique of the standard soil conservation approach and the fertiliser-seed extension package (when applied to marginal areas), a well-specified alternative has yet to emerge. Work on broader land management and integrated soil fertility management, however, offers the outline of an alternative perspective. Studies of indigenous soil conservation techniques (for example under the Indigenous Soil and Water Conservation programme at Mekelle University College), nutrient cycling and soil management (for example by SOS-Sahel and FARM-Africa in southern Ethiopia) and catchment management and land husbandry (for example by MUC and the Institute of Sustainable Development in Tigray) are some examples which point to alternatives more suited to marginal areas and poorer people.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

A number of key areas of policy are significant in the link between soils management and sustainable livelihoods in Ethiopia. These include:

Fertiliser and input supply. Fertiliser use has increased significantly in the last few years in response largely to the expansion of the extension programme. Imports have risen to 420,000 MT in 1999. This is projected to increase to 1 million by 2010. The Fertiliser Sector Support Project (Phase 1) supported by the World Bank and co-ordinated by the National Fertiliser Industry Agency has been an important vehicle for the reform of the fertiliser sector. A second phase of this programme is due to start in 2000. Imports are currently funded by a combination of donor contributions (66% in 1998, although this amount varies each year), loans and government funds. While the government is fully committed to an expansion of fertiliser use as the core of its agricultural strategy (the government's development strategy of Agricultural Development Led Industrialisation (ADLI) prioritises agriculture), the high costs of the import programme (especially if donor grant contributions decline) remains an issue. As part of a broader programme of economic liberalisation started in 1991, from 1997 subsidies on fertilisers were removed and a free market encouraged. A number of regionally based trading companies have been established which dominate the market, although a small number of other private companies exist. At this stage competition remains limited and, although prices have fallen in high consuming areas, distribution to other areas remains a problem. Margins for small scale traders are small and their access to inputs can be constrained by the domination of larger importers and suppliers who gain access to imported fertiliser through a regionally based bidding system. These companies are in the process of developing a supplier and trader system for supply to more remote areas, but questions about the commercial viability of this option remain. Major challenges of institutional reform are central to policy questions in this area, particularly if a fertiliser based strategy is to be sustained and expanded to currently low consuming areas. This in turn is linked to broader strategies for rural development and particularly infrastructure. If supply costs are to be reduced significantly in order for markets to expand and for fertiliser costs at the farm gate to be reduced, then major improvements in road infrastructure and transport availability will be key.

Rural credit. Credit for input purchase is currently linked largely to the national extension programme. This provides a fixed package of inputs (seeds, fertilisers) with a standard credit arrangement (involving a 25% down payment and credit repayment immediately on harvest). This programme has had some major successes in good years and in higher potential areas allowing farmers to expand the use of fertiliser significantly (see above). However in other years and in other places the story is more mixed. A number of criticisms have been raised. These include:

- the strict linkage between the credit and a fixed technology package – little or no flexibility is allowed and farmers are therefore unable to adapt their input requirements to their particular circumstances;
- the adherence to a fixed timetable for repayment means that credit must be repaid when crop prices are at their lowest meaning that a higher proportion of crop production is sold for credit repayment;
- poorer farmers and those who suffer crop losses due to pests or drought have been unable to repay, encouraging a cycle of debt. Asset confiscation and sometimes imprisonment have been reported in a number of areas.

More flexible credit from other sources is currently limited. Some local savings and loan mechanisms exist, but these tend to be associated with crisis provision. Alternative credit arrangements are currently limited largely to regional credit organisations, with NGO schemes having been recently restricted.

Thus a number of major policy challenges arise in the context of effective and affordable credit provision to the smallholder producer sector. These issues are currently highly contentious and not subject to widespread discussion.

Land use and tenure. Questions of land use and tenure dominate many people's commentaries on environmental and land management issues. The increasing fragmentation of land holdings combined with a sense of insecure tenure is argued to contribute to low levels of investment in agriculture (including soil fertility management). Many commentators argue that some form of secure tenure arrangement (not necessarily privatisation) is required, combined with a flexible approach to voluntary resettlement. However, the government has consistently insisted that the constitutional provision that all land is held by the state will not be altered. Justifiable fears of an expansion of land consolidation, landlordism and landlessness mean that the political consequences of reform are high on the agenda. The consequence is that while this issue is raised regularly in discussion, wider debate is currently not an option. Land tenure arrangements in most areas are enormously complex, with overlapping property rights and ambiguous arrangements encompassing combinations of quasi-private holdings, with sharecropping, leasing and contracting arrangements. In some areas informal (and illegal) land markets exist with the effective transfer of informal title to land exchanging hands. Thus the degree of actual land tenure insecurity is enormously varied. In some instances, it is argued that the de facto case does not currently prevent investment in natural resource management. In others, however (particularly where land redistribution is being carried out), perceptions of insecurity run high.

Agricultural research and extension. The broad outline of current research and extension approaches have already been outlined. The extension strategy in particular carries with it significant political support and is seen as central to the government's Agricultural Development Led Industrialisation strategy which guides overall policy. As already noted, the considerable successes of the programme in some higher potential areas have not been replicated elsewhere and a growing acknowledgement exists, at least in some quarters, that an approach more attuned to marginal areas is needed to complement the existing focus. In response to this the Ministry of Agriculture has responded by adding a range of additional packages to the programme. However, currently these do not address the full range of farmer needs. In particular, a more integrated approach to soil fertility management does not feature particularly strongly in the programme.

In part this is a consequence of the lack of research in this area. This has been recognised in the ongoing re-evaluation of the strategy for national agricultural research being undertaken by ERA. In the field of soil and water management, for instance, a more holistic and integrated approach is needed, to go beyond the design of crop packages and fertiliser inputs. It is also acknowledged that a greater socio-economic and policy input will be required in the future, alongside a more demand driven participatory approach to technology development. Given that the restructuring of the research system is still underway, it is too early to judge how this will influence both the process and content of technology development in the future.

Clearly in this context there are a number of key areas where focussed discussion on strategy and direction could occur both in respect of extension and policy. The challenge will be how to convene such a process (see below).

Environment. Following the National Conservation Strategy process (1989 to 1998), a number of regional exercises have been carried out resulting in a series of regional strategies. These are complemented by a new national environmental policy overseen by the recently created Environmental Protection Agency. The NCSA process involved extensive consultation both at national and regional level and, involves links to regionally based contact points, usually in the regional planning bureaux. At federal level, co-ordination is facilitated by offices in the PEA and in the Ministry of Economic Development and Co-operation. While these processes have raised the profile of the environmental debate in the country and among key actors across a range of ministries and bureaux, the process of implementation has been slow. In part this reflects the complexity of cross-sectoral co-ordination on a multi-faceted issue, but the environment also does not feature very high on the core policy objectives of government, focussed as they are on food self-sufficiency and agriculturally led growth. However, despite this a number of initiatives, including the development of EIA guidelines and project appraisal indicators have been started, and training and capacity strengthening at regional level is on-going. In terms of the major line ministries (notably agriculture), however, environmental issues remain firmly associated with the 1980s agenda of soil conservation and afforestation. Broader questions of environmental sustainability (including pollution and health issues) do not really feature in discussions about the core focus of agricultural policy, the fertiliser led extension strategy.

POLICY PROCESS ISSUES

Open debates about policies remain relatively rare in Ethiopia. Tight networks centred on the Prime Minister's office and involving senior officials in federal line ministries and regional bureaux and administrations tend to decide on policy directions. Much policymaking is highly politicised, particularly around sensitive issues such as land use and tenure. Although consultations, workshops and reviews certainly occur and a range of stakeholders meet at these, there exists scepticism about the degree to which these have an impact. The exceptions, however, are perhaps areas of policy which are somewhat uncontroversial, the environmental policy and conservation strategy being good examples. The need for wider, more inclusive fora for policy debate is increasingly recognised and some organisations/groupings (such as the Forum for Social Sciences, the Forum for Land Husbandry and the Environment Forum) have been recently established to encourage such debate. However the current form and nature of the policy process makes such mechanisms very difficult, and reliance on informal channels of access to key decision takers is vital.

The role of NGOs and broader civil society (including the media) in policy agenda setting, formulation and debate therefore appears to be very limited in any formal sense. Where NGOs have been directly involved in the policy process (most notably SG-2000 on the extension strategy) this has been through exceptional political connections (in this case facilitated by former President Jimmy Carter), or close associations with party and government structures (e.g. REST in Tigray). Donors have some leverage through the funding of projects and in negotiations with government on loan and other budget support arrangements. However, most of these discussions are brokered by the World Bank thus limiting any specific influences.

Donors and others have had more substantial influence at regional level where good relationships with regional governments have emerged. NGOs working on project specific interventions at local level have had indirect influence on policy initiatives at regional level through the development of pilot project areas and the sharing of experience with government through training and broader institutionalisation programmes. However there are large regional differences in policy processes. This reflects differences in capacity, political connections, resources and general confidence in regional government.

The Soil Fertility Initiative was barely mentioned during our discussions with different people. Most had heard of it, and noted the meeting, but there does not seem to be wide 'ownership' of the process. Even the local FAO office had little to say about it, referring us to Rome for information. The initiative is co-ordinated by the NFIA and so is firmly linked to the World Bank fertiliser support project. The NFIA invited a wide range of players to attend the Addis meeting, but little seems to have come of it. Indeed the impression gained is that this is an external initiative from FAO, Rome and World Bank, Washington, which has little impact on national policy processes at the current time.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

In the process of consultation a number of potential activities were identified to respond to the situation analysis outlined above. These include:

1. Preparation of a summary status report and gap analysis of current research and development activities in the area of soil fertility management and sustainable livelihoods, including a comprehensive national inventory of who is doing what and where, and, subsequently, an analysis of key gaps in information which would be important in informing policy debates.
2. A specific compilation of research and other experience of soil fertility and land management practices in marginal areas (defined as not the major highland cereal growing areas, including the perennial crop zone and more dryland cropping/agropastoral areas). The aim would be to begin to compile an outline of the key issues, technological choices, and implementation process questions complement the high potential area research and extension focus.
3. This would in turn lead to the identification of future research priorities that could be linked to EARO's strategy development in this area. Specific projects could then be commissioned to fill gaps. A series of 4-5 strategically chosen research projects that, together, would provide key information to the policy debate, would be commissioned at this stage.
4. The establishment of a debating forum for the discussion of future research and extension strategy (and linked policy issues such as land, credit, water development etc.) in marginal areas with a focus on soils/land management and sustainable livelihoods. This could, for instance, link to inputs to Phase II of the National Fertiliser Sector Project and the proposed Food Security Programme in four regions.

Key actors

Such activities would have to link a range of key actors. Clearly EARO is potentially a key partner given its national mandate and links to regional research activities. Such a body may have the credibility and legitimacy to convene such a process. However, given the lack of experience in many of the areas identified as key, other partners would have to be involved. A number of NGOs – notably SOS-Sahel, FARM-Africa among others – have developed considerable experience from field level research and action in different parts of the country, as have researchers and others at universities and colleges – for example Mekelle University College.

This document will be discussed among a range of potential partners in Ethiopia in order to come up with a more detailed and budgetted plan for future activity. This process will

be co-ordinated by the Natural Resource Management and Policy Unit of SOS-Sahel. The key contact for follow up will be: Dr Eyasu Elias, SOS-Sahel, Addis Ababa.

Appendix 1: People met during June 1999 visit

1. Dr Paulos, Director of Soil and Water Research, EARO
2. Dr Zinesh Sileshi, Director of Livestock Research, EARO
3. Abi Masefield, Food Security Field Manager, DFID
4. Zeleke Dessalegne, General Manager, National Fertilizer Industry Agency
5. Dessalegn Rahmato, Director, Forum for Social Studies
6. Ato Sessey, FAO
7. Dr Eyasu Elias, Feyera Abdi, SOS Sahel
8. Dr Tefara and Rahel Mesfin, Centre for the Human Environment
9. Tameneh, Environmental Protection Unit, MEDAC
10. Gideon Asfaw, IUCN, technical advisor to the Conservation Strategy for Ethiopia
11. Dr Marco Quinones and Takele Gebre, Sasakawa Global 2000
12. Dr Musaret, Mekane Yesus (church based NGO based in Awassa)
13. Commissioner for Sustainable Agriculture and Environmental Rehabilitation, Southern Region
14. Extension Department Head, Bureau of Agriculture, Southern Region

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SECTION 2
COUNTRY REPORTS

KENYA

2.2 *KENYA*

Alistair Sutherland and Andrew Dorward

Information was gathered during consultation with a range of individuals and organisations, listed in appendix 1. The report has been circulated to the stakeholders consulted in Kenya in order to validate the information in the report, and to obtain feedback. However, substantive feedback has been limited.

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Rural livelihoods in Kenya are affected by a number of trends and shocks. Continuing population growth in both the higher potential and marginal farming areas is placing increasing pressure on land, with declining farm sizes as a result of subdivision arising from inheritance and sale of land. Female-headed households are disproportionately represented amongst the disadvantaged households. It is increasingly difficult for young adults to get independent access to land, and land is traditionally controlled by men. Economic growth has slowed down recently, putting a squeeze on money circulation and rural incomes. Fluctuating commodity prices (particularly coffee) and delayed payments to farmers (particularly for milk and sugar cane) provide economic shock waves for rural households. Markets for profitable horticultural crops are substantial, but their fickle nature makes it difficult for all but the very astute smallholder producers to make a reliable income from horticulture.

Continuous cultivation of maize and beans in the high potential areas, often without fertilisers, has led to declining soil fertility and yields. In the west of Kenya, Phosphorus (P) has been identified as a limiting factor in many of the soils. For example in some parts it has become difficult to grow beans, possibly due to an inter-related complex of declining soil fertility and fungal disease. Soil fertility decline has led to reduced incomes from sales of surplus food crop production and to increasing food insecurity and poverty. Devaluation of the Kenya shilling during the late 1980s and early 1990s led to sharp increases in the costs of imported fertilisers, but these were not matched by comparable rises in maize prices. As a result there are often only marginal benefits (and consequent significant risks of loss) in applying fertiliser to maize produced for sale. Partial failures in liberalised input and output markets and a contraction of smallholder credit support have further depressed smallholder maize production. Private traders operate in rural areas, but farmers usually obtain very poor prices for food crops shortly after harvest time and pay much higher prices when repurchasing maize and other food crops later in the year/season. Some crop diversification is occurring, with an increased dependence in some areas on root crops, vegetables, tree crops and alternative legumes.

Droughts are the common shock in the marginal farming areas, with frequent need for government intervention in the form of food relief and free inputs (seeds and fertiliser). This is made worse by cropping (and food) preferences for maize and beans in most marginal areas, further increasing risks of crop failure. Recently unseasonable and

extraordinarily heavy rains, caused by the El Niño effect, led to flooding and heavy pest and disease pressure in the marginal areas.

In rural areas, alternative employment to agriculture is not easy for young people to find. Even after secondary and higher education there are large numbers of young people who are not able to find employment. Increasing prevalence of AIDS and related diseases has placed added burdens on families in the badly affected rural areas (particularly the west of Kenya). School enrolment has started to decline, largely in response to the rising costs associated with parental contributions for uniforms, books, building levy, etc.

SOIL FERTILITY MANAGEMENT INTERVENTIONS

Interventions directly addressing soil fertility management include the following: national agricultural research and extension programmes, international agricultural research and development efforts, organic farming programmes, private and NGO inorganic fertiliser packaging and distribution programmes, community based projects with a food security and natural resource management component, and drought relief programmes distributing seed and fertiliser (free, or in exchange for public works and work on soil conservation structures).

Developmental approaches and philosophies (e.g. the organic vs. inorganic positions) have, in the past, had a significant influence on the design of soil fertility related intervention programmes. However, conversations we had indicated increasing emphasis on the integration of inorganic and organic soil fertility management practices by both government and NGO research and extension programmes. This convergence of philosophy will take time to filter down to the field level, where both farmers and front line staff often hold strong opinions about the virtues, limitations and pitfalls of organic and inorganic fertiliser.

Since Independence, special emphasis has been placed on soil and water conservation extension, which has had its own extension arm, in addition to general (T&V) extension and livestock extension. The National Soil and Water Conservation Programme (NSWCP) was established in four districts in 1974, and currently covers all districts of Kenya – with 25 years of support from SIDA. Added government support was provided through the establishment in 1981 of the Permanent Presidential Commission on Soil Conservation and Afforestation. In 1984, agro-forestry was added as a major component to the NSWCP, and in 1992 PRA was introduced as part of a catchment approach. Historically, extension activities have been dominated by the Ministry of Agriculture Extension Department, but NGO programmes are playing an increasingly important role. SIDA has supported two of the twelve ASIP task forces, on extension and on land tenure. A GTZ consultant on extension has recommended that the NSWCP model of extension be adopted as part of a unified extension system. Current extension policy recognises the inherent weakness in the T&V approach, and puts more emphasis on an integrated extension system using group based and participatory methods. Farmer field schools, introduced through the Kenya Institute for Organic Farming (KIOF) to promote organic farming, are being piloted with

FAO support as an extension approach in five districts, and may also be taken forward by some of the Kenya Agricultural Research Institute (KARI) regional research programmes.

Soil fertility emerged as an important issue during PRAs conducted by the NSWPC extension staff during the mid-1990s, following widespread implementation of physical conservation structures in high potential areas. This resulted in a shift in emphasis, from physical structures and agro-forestry to improved land husbandry. On soil fertility issues, government general extension programmes have emphasised inorganic fertiliser use since the 1960s.

The NGO sector has, for over a decade, actively promoted organic farming ideas and methods (including agro-forestry). NGOs that have specifically focused on providing training in organic methods include KIOF, Manor House Agricultural Training Centre, and Association for Better Land Husbandry. These NGOs trained farmers initially, but later focused more on providing training to other organisations. As a result organic farming ideas and methods have also been promoted by a large number of community based organisations and by some of the larger NGOs (Action Aid, CARE, PLAN International, World Vision and Oxfam). Often extension efforts are provided in the context of community based approaches to food security, savings and credit clubs, and education, health and roads services and infrastructure.

Research into soil fertility management has been carried out by KARI, the agricultural universities (Nairobi-Kabete Campus, Egerton, Kenyatta and Moi), and the international research programmes based in Kenya (particularly by ICRAF and TSBF). Much of this research is conducted collaboratively, and there is an extensive technical published and grey literature. Apart from on-farm fertiliser verification trials (through the Fertiliser Use Research Project) most of the research conducted up to 1990 was factor and researcher-oriented. However, since 1990 increased emphasis has been given to on-farm trials, and to studies and monitoring of soil fertility status and farmer practices.

Geographically, soil fertility research has focused mainly on Western Kenya (where soil fertility problems are recognised to be most serious) and also highland areas of Central and Eastern Kenya. An informal inventory recently started by Dr Nandwa of KARI listed over 70 research ongoing activities being funded and implemented by over 20 agencies in Western Kenya alone. The Rockefeller Foundation has played a pivotal role, both in promoting networking on soil fertility research, and in supporting on-farm research approaches by KARI and other research organisations. ICRAF has collaborated with KARI and KEFRI through the AFRENA programme in a strong on-farm research effort in Western Kenya to tackle problems associated with declining levels of P and also hosts the African Highland Initiative (AHI). AHI has a working group headed by TSBF on soil fertility and use of manures as a crosscutting issue on benchmark sites in Western and Eastern Kenya. It also has a policy economics working group, currently looking at improved policies for soil and land management at community level in Ethiopia and Uganda, including marketing issues. A Dutch funded nutrient monitoring project co-ordinated by KARI in Kenya (NUTMON), has recently completed its work in six African countries and has moved into networking (NUTNET) between the countries. A

Systemwide Livestock Project (SLP) is working with AFRENA and looking into use of animal manures and recycling nutrients through animals. FARMESA and AHI are funding innovative on-farm research using test strip crops and screening of various crops and varieties under high and low soil fertility conditions. Kenyan research and extension staff are connected to a number of soil fertility related networks, including VARINUTS, LEINUTS, POLINUTS, SWNM and NUTSAL.

The ICRAF/KARI-led research and related development centring around use of rock phosphates and agroforestry in Western Kenya is associated with the World Bank and its Soil Fertility Initiative (SFI). However, the SFI, as envisaged in the World Bank guidelines on the formulation of a national action plan, does not appear to have strong formal recognition in Kenya.

In semi-arid areas the challenges for soil management related research and extension are different. These areas are receiving influxes of population; settling pastoralists from both the arid areas and land seeking crop farmers from the high potential areas. The soils in these areas are both more varied and more fragile. In terms of extension, NSWCP has given increased attention to these areas and accepts that different technologies and extension approaches are needed. In marginal areas, front line staff involvement in relief programmes has worked against the adoption of more participatory extension approaches, but at the same time has provided an opportunity to address soil and water conservation concerns through food for work programmes. Soil fertility is increasingly recognised as a constraint in the marginal areas, with strong interaction between fertility and moisture availability.

The seed sector has seen an increasing number of private companies entering the market, and a new body (KEPHIS) has been set up to regulate seed production. However, these companies focus mainly on hybrid maize, wheat and vegetable seeds. The regular supply of seed for new varieties of food legumes, green manure crops, millets and sorghum and root and tuber crops (including Irish potatoes) remains a big problem, and constrains farmers choice of which crops to grow thus limiting rotation and intercropping SFM options.

Activities promoting access to inorganic fertiliser focused initially on extending farmers' access to input finance. More recently use of smaller packaging has been promoted. For example SCODP, an NGO operating in four Districts in Western Kenya, has pioneered methods to stimulate smallholder use of fertilisers by working with private traders to sell a range of fertilisers in sample size packets, and through participatory on-farm trials, to address issues of more appropriate fertiliser formulation and blending. Among the larger private sector fertiliser players, Norsk Hydro stands out as the most innovative, packing a range of fertilisers in smaller packages as a marketing strategy.

Spontaneous on-farm adoption of soil and water conservation and agroforestry has been taking place, particularly in the higher potential areas of eastern Kenya. This includes boundary planting of crop compatible tree species, terracing construction and stabilisation, manure application and composting, and double digging of small areas. Some organic

technologies developed for soil fertility enhancement, particularly alley cropping, have not so far been attractive to farmers given their land and labour constraints. Composting and double digging of small patches for horticultural production have become popular in higher potential parts of Western, Central and Eastern Kenya, but are not popular in the drier areas.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

A broad view of policy relating to soil fertility management includes strategic decisions by a range of influential government and non-government stakeholders (e.g. fertiliser and seed companies, agricultural finance institutions, donors, large NGOs) relating to access to fertilisers and legume seed through input distribution, credit and marketing support. Kenya's experience shows that soil fertility management by farmers is not simply the application of technical knowledge to the land they cultivate, but also depends upon their access to crop output markets, food security and poverty factors, local regulations on cash crop management, input/output price ratios, and the ability of private companies to invest in rural markets. These in turn are influenced by policy implementation with regard to macroeconomic management (devaluation, interest rates, and inflation), rural infrastructure (roads and telecommunications), safety net and rural welfare programmes, law and order, and rural institutions affecting property rights. A comprehensive view of soil fertility management policy must allow for this wider range of policy effects, but not lose focus on central underlying bio-physical processes that support the natural capital base of rural livelihoods.

Policy can include sub-national levels, each with a range of stakeholders. Leaving aside the influence of global policy initiatives (and the influence of multinational fertiliser companies), local level legal processes and decision making are very important. For example, traditional authorities influence land use policies, private traders influence input supply choices, terms and conditions, and farmer co-operative organisations (e.g. coffee co-operatives) crop management and marketing rules. Regulations are still operative that restrict the movement of food produce between parts of Kenya. These may be enforced differently in different areas, hampering the development of free agricultural markets. The sub-national level of decision making is particularly important with soil fertility management, where various stakeholders are acting with different objectives in local conditions that are varied and complex.

Within this broader view of policy, a number of issues related to soil fertility management were identified.

1. Targeting the poor, especially in Western Kenya: For the poorer in Western Kenya, low soil fertility has immediate welfare implications, causing low productivity, low incomes and food insecurity. Most of the poor in the west still have access to land, but are limited by labour and cash constraints, working for the richer households. Improving poor farmers' access to inorganic fertilisers is problematic in terms of sustainability, unless it can be achieved indirectly by raising their incomes through cash cropping or non-farm

income generating activities. Organic soil improvement options for the poor may be cost effective, if they are able and willing to adopt these more labour intensive methods. There is a critical need to develop approaches to soil fertility management that effectively address both welfare and investment objectives.

2. Developing and harmonising extension around inorganic/organic combinations: The complimentary interaction of inorganic and organic technologies is being more widely recognised and proven through on-farm research. Today there are very many more potential SFM options available to farmers in higher potential areas than there were a decade ago. However, knowledge of how to combine these is not widespread, and current extension approaches are not well geared to assisting farmers with different resource levels to select and combine the available options. Some organic farming enthusiasts have “demonised” inorganics in the minds of some smallholder farmers. Until recently, the government extension and research services have given very limited attention to organic alternatives. Organic technologies based on legumes suffer increased risks from pests and diseases and may demand greater management skills and labour. Reversals of attitudes and new approaches to technology transfer and adaptation are required, such as farmer research groups and farmer field schools.

3. Addressing market failures: Weaknesses in markets are proving to be a major obstacle in cases where projects have introduced higher value crops alongside soil fertility interventions in an attempt to improve livelihoods, and encourage farmers to re-invest cash earned back into their soils. Ways of stabilising markets and further increasing high value cropping options are urgently needed as an indirect and longer-term solution to smallholder soil fertility problems.

4. Fertiliser prices and blends: While an increasingly wide range of inorganic fertilisers are available, and in smaller packets, fertiliser prices remain high and further improvements can be made in blends suited to local conditions. There may be scope for more dialogue (between fertiliser companies, traders, extension staff and farmers), simple on-farm experimentation and sharing of ideas and knowledge of how to give small-scale farmers more access to, and a wider choice of, inorganic fertilisers.

5. Legume seed supplies: There are shortages of legume seed and planting material for improved grain legumes (particularly in semi-arid areas) and green manure crops. More sustainable systems for producing and distributing these types of seed need to be developed and widely institutionalised in order to widen the soil improving cropping options for resource poor farmers.

6. Institutional change management in the context of liberalised market conditions: Market failure, and the very slow pace at which government institutions are responding to the new challenges and roles, are major constraints to the uptake of SFM options. Moreover, many NGOs find natural resource programmes difficult to implement, lack some of the technical expertise, and go for higher profile interventions such as advocacy and alternative health and education programmes for the poor. Traditional authorities and their roles in NR management have been neglected. Methods for institutional development and change, in all sectors (private, government, NGO, CBO and traditional authorities) in support of sustainable NR management are a pressing need. This could take the form of action research, drawing on the methods and approaches used in successful local

organisations, and in private and public sector change management developed in other countries

7. Is co-ordination of key players an issue, and can information be shared more widely to greater effect? There are many players addressing issues related to SFM in Kenya, and a number of groups and networks in existence. Further co-ordination of these through the establishment of parent bodies may not be feasible, particularly in the context of a liberalised and pluralistic institutional environment. Yet for many organisations involved in rural development it is not easy to get information about all that is going on, including both technical and local policy and institutional options for addressing soil fertility issues as part of sustainable development. This need could be met through a directory of relevant organisations and activities, a data base of soil fertility technology options, and exemplary case studies showing how soil fertility management has been addressed through an integrated approach, addressing most of the areas listed in points 1 to 6 above.

POLICY PROCESS ISSUES

Policy development and implementation in Kenya take place at different levels. At national level, sessional papers are drafted and approved by parliament, including action plans, and some are enacted as bills through parliament. For example there is a National Environmental Action Plan formulated after the Rio Earth Summit, a Seventh Development Plan (1994-96) with the theme “resource mobilisation for sustainable development”, a session paper on food security, a National Poverty Action Plan and a pending Environmental Management Bill. National institutions also develop mission statements and strategic plans to guide their growth and activities. Government ministers make official statements and decisions. Donors and private sector companies do the same. NGOs are involved in trying to influence policy, particularly the content of sessional papers, through joint advocacy activities. Action Aid, for example, has a policy research unit that is active in advocacy.

In agricultural research relating to soil fertility management there are a number of stakeholders (researchers, research managers and donors) and these often work together.

The large number of players, the rather open and pluralistic research and development process, with many actors and opinions at various levels, makes the formulation and implementation of a tightly co-ordinated nation policy, or initiative on soil fertility, a somewhat problematic concept.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

The preceding sections have identified some key areas where policy related co-ordination and management may be developed. The structures and processes through which these key areas of policy might be addressed require further exploration. Discussion with a range of stakeholders definitely suggests the need for more sharing of information, and also for action research into the institutional change process. There is need for learning more about

appropriate mechanisms and processes for effective information management, the kind that leads to more co-ordinated action and supports appropriate change in the way that key (public, private and NGO/3rd sector) organisations function at various levels. Possible options to follow up this preliminary analysis are outlined below, and rounded off with a concluding assessment of the scope for Kenyan involvement in possible phase 2 activities. Each option rests on a stated assumption, and the first implies no further action. These options are not mutually exclusive.

Option 1: Comparatively little can be achieved by policy or action research in a crowded field. There is therefore no need for any further co-ordinated action to integrate decision making regarding soil fertility policy. There are so many players involved, and in the context of pluralistic institutional development and a liberalised market, efforts at tighter co-ordination (at least at national level) may not be feasible.

Option 2: Kenya has a large amount of experience in participatory soil fertility research on-farm that is of wider applicability. It could host study visits to share experience with other countries in Africa, particularly in on-farm research into soil fertility management and the range of options available for a range of soil and climatic conditions. This option may well be covered under existing regional soil fertility networks, but with an option of including practitioners from other countries in a phase 2 programme.

Option 3: Information is not widely available on location specific soil fertility management options and activities, and lack of information is a significant constraint within Kenya. Existing activities (research, extension, input support and marketing) relating to soil fertility management at national and sub-national levels could be inventorised and published to encourage more open access to information by all stakeholders.

Option 4: There is a need to develop appropriate extension methods for a more integrated approaches to soil fertility management, perhaps those using participatory action-learning principles. The current experience with innovative extension methods tried could be documented and shared in a forum, with a view to improving soil fertility management extension best practice among interested organisations. This may also go further into sharing experiences and best practice at regional level.

Option 5: Better co-ordination among key stakeholders at sub-national level would significantly improve organisational performance in the provision of services to smallholders interested in soil fertility. Commissioning studies to document successful cases of local co-ordination, illustrating stakeholder benefits and identifying principles and models for integrated decision making and action could provide a resource for better stakeholder co-ordination. This might build upon current research into the uptake of organic soil fertility enhancing technologies and provide the basis for workshops or travelling seminars to stimulate more sharing of positive experiences.

Option 6: For action research on soil fertility management to be most effective, it should be closely linked to an ongoing or planned rural development initiative, ideally one in a position to influence national policy. Possibly building on options 2 and/or 3 above, this option would develop and test processes and models for working with stakeholders and communities in a more integrated way, to feed lessons back to implementers and policy makers operating at different levels. This option could be “bolted onto” a

planned or existing area focused development programme that is addressing natural resource management issues in the context of sustainable livelihoods, and has an advocacy and policy influencing role.

Option 7: Implementation of a more integrated approach to planning and policy relating to soil fertility requires changes in the way key organisations currently operate. This can be addressed by action-oriented research with a view to promoting a change management process in key institutions (e.g. research organisations, extension organisations, fertiliser companies and NGOs heavily involved in agriculture). Organisations would clearly have to be ready and willing to participate in this type of research, which may focus at sub-national levels of an organisation with the support of the senior management.

Conclusions

If any of the options 2 to 7 are to be taken forward, further consultation with relevant stakeholders, including those met during the country visit is needed. The low level of response received to date may suggest one of several things. It may suggest that option 1, to do nothing further, is the preferred outcome. Or it may mean that there is need for further dialogue in order to more effectively gauge potential relevance. Based on the analysis and information sourced during the country visit, we would suggest that options 3 and 5 may be most relevant in terms of adding value to ongoing activities.

Potential stakeholders will vary depending on which, if any of the options may be pursued. Potentially they include; farmer organisations, input suppliers and distributors, produce marketing organisations and traders, soil scientists and agronomists, extension services, policy analysts, district and national policy co-ordinators and development agencies and donors concerned with soil fertility management and sustainable rural livelihoods.

Appendix 1: Persons and organisations consulted

1. Action Aid, Nairobi
2. Tom Anyonge, Programme Officer, Sida
3. Dr Steve Franzel, Head of Socio-Economics, ICRAF
4. H Ade Freeman, Economist, CGIAR
5. Dr Richard Hogg, Senior Social Development Advisor, DFID East Africa (Nairobi)
6. Daniel Gustafson, FAO Representative in Kenya, FAO
7. J.W. Inungu, Senior Researcher, KARI
8. Richard B Jones, Technology Specialist, ICRISAT
9. Richard Kaguamba, Environmental Specialist, World Bank, Kenya
10. J. K. Kiara, National Soil and Water Conservation Programme
11. Dr F. Kihanda, Principal Researcher, KARI
12. R.M. Kiome, Assistant Director, KARI
13. Dr Martin Leach, Senior Natural Resources Advisor, DFID East Africa
14. John K. Lynham, Senior Scientist, The Rockefeller Foundation, Nairobi
15. A.N. Micheni, Researcher, KARI
16. Dr Stephen Nandwa, Head of Soil Laboratories, KARI
17. James K. Nyoro, Senior Research Fellow, Egerton University, Tegemeo Institute
18. Asenath K. Omwega, Programme Manager, Intermediate Technology, Kenya
19. Frank M. Place, Economist, International Centre for Research in Agroforestry
20. Dr Helga Recke, Project Advisor, KARI
21. Dr David Rees, KARI/DFID Adaptive Research Coordinator, Kitale Research Centre
22. Johan Rockstrom, Water and Soil Fertility Advisor, Regional Land Management Unit (RELMA)
23. Said N. Silim, Principal Scientist/ICRISAT Country Representative, ICRISAT
24. Patrick M. Sikana, Researcher, Tropical Soil Biology and Fertility Programme

SECTION 2
COUNTRY REPORTS

MALI

2.3 MALI¹

Camilla Toulmin and Thea Hilhorst

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Farming provides the basic source of food and income for most rural Malians. Nevertheless, most rural households also pursue a range of other activities, which include migration, trading, and craft work. The significance of these activities varies from household to household, and place to place. They often provide a very important source of funds for investment in the farming sector. For example, in the absence of easy access to credit, migration earnings frequently constitute the primary means by which people fund the purchase of a plough team or donkey cart. Migration is not just a coping strategy for poor households in times of trouble, but a means by which better off households diversify incomes and provide their members with opportunities for individual wealth creation. Migration also provides a rite of passage for young men. Thus, for example, a number of villages in Mali-Sud regularly send off a major part of their labour force to work in their own, or other people's coffee and cocoa plantations in Ivory Coast. This provides a major source of revenue for funding household and investment needs back in Mali.

SOIL FERTILITY MANAGEMENT INTERVENTIONS AND POLICY ISSUES

Agricultural policy in Mali has followed fairly similar lines to that found in many other African countries. Following Independence the government took a centralised approach to economic growth in general, with a strong role to be played by the state in industrial development and large Rural Development Schemes. The process of Structural Adjustment in Mali began early in the 1980s, with the dismemberment of OPAM which had attempted to attain cheap grain supplies for the cities by fixed price requisitioning of grain from farmers and control over rice production. Multi-donor support for the restructuring of the cereal market through the mid-80s brought the freeing of cereal prices and a cutback in state engagement in agriculture.

The droughts of the mid-70s and 80s also provoked a revision of policy towards greater attention for anti-erosion measures, natural resource management and the *gestion de terroir* approach, which has been taken up by many donor and NGO projects. Such approaches involve the progressive shift of responsibilities for resource management to local communities through the constitution of village committees for resource management, definition of land use management plans, and investment in various soil conservation measures. The vulnerability of farming to drought also led to a further emphasis on the role of the irrigated sector, its rehabilitation and future expansion. Processes in favour of decentralisation and land tenure reform are also under way and set

¹ See Appendix 3 for contextual material on the country; agro-ecological information in particular.

the broader framework within which farmers and herders must negotiate access to key resources.

Environmental strategies have multiplied with the design of a National Plan to Combat Desertification in the late 1980s, followed by a range of Rio-related activities, such as the drafting of an National Environmental Action Plan (NEAP). Mali was heavily involved in negotiation of the UN Convention to Combat Desertification (CCD) and has recently held a donor round table to seek support for activities identified under its National Action Programme (NAP). These include National Programmes on land development, natural resources management, water resources management, improvement of life quality, new and renewable energy resources, and environmental information management. The work of the NEAP and NAP has been carried out jointly, in an attempt to avoid too great a duplication of activities.

Policy issues emerging

The surveys carried out in association with the SFI (Gakou et al., 1996, Doumbia et al., 1998) have identified a number of key issues for improving soil fertility management in Mali, as follows:

- i. Cotton yields in long-established areas are said to be stagnating, if not declining. Such trends seem to be due to various factors, such as the need for increased use of organic fertiliser to supplement chemical supplies, input-output price ratios for cotton which are less advantageous than before, uncertainty surrounding access to credit and inputs, and greater interest in alternative crops – such as maize and vegetables.
- ii. The growing difficulties faced by rainfed cereal producers in more marginal areas where rising pressures on land are making traditional methods of soil fertility maintenance less feasible (fallow, nutrient transfer through livestock). At the same time, these drier areas have few obvious cash crop options, given distance from markets and few areas of competitive advantage over higher potential zones.
- iii. In the irrigated areas of the Office du Niger, soil fertility management as such is not regarded as a major constraint although there are some localised problems of alkalinity. Farmers' worries include costs of inputs, access to credit, rising water tables, rice disease. Following the Office de Niger's lifting of the prohibition to cultivate vegetables in rice fields during the off season, many farmers responded by diversifying into vegetable production, with heavy reliance on organic manures. Future tensions are likely regarding access by visiting herds to grazing resources, and tightening of property rights over harvest residues.
- iv. The need to establish improved access to a range of inorganic fertiliser supplies in association with accessible and efficient credit and saving systems better tailored to the range of farming systems and conditions found across the country. Plans are underway to establish a bulking and blending factory at Markala, near Segou

which can capitalise on available supplies of rock phosphate by mixing with other nutrient sources. Work by IFDC argues for complementary measures in the form of further liberalisation of trade and markets in input supplies, improving access to credit, and encouraging traders to make supplies available in smaller quantities.

Mali has recently started work on a soil fertility plan, as part of the Soil Fertility Initiative (SFI), with technical support provided through FAO. Currently, there exists a small committee (Equipe Nationale de Co-ordination et Facilitation) responsible for undertaking several activities which include:

- i. A review of the main problems and priority areas for improving soil fertility management in the different farming systems,
- ii. A study of technical options for improvement of soil fertility based on actions already underway in Mali,
- iii. Preparations for a series of regional consultations to identify in a participatory fashion the priority issues in different parts of the country, and
- iv. A study of the distribution networks for fertiliser supply, with a view to proposing the construction of a blending factory at Markala, on the River Niger which could make use of Mali's natural rock phosphate supplies.

Currently these activities are in abeyance pending agreement with the World Bank on the funds deemed necessary to carry these out. In the meantime, a national steering group has been set up with 15 members drawn from a dozen government structures, plus the World Bank, FAO and Dutch Embassy. The Dutch Embassy also convened a discussion in March 1999 on the sustainability of cotton based farming systems with special attention on soil fertility management. The Dutch have been heavily involved in support to the International Fertiliser Development Centre (IFDC-Africa), based in Lomé and the development of the national soil fertility action plan in Burkina Faso. Funding from the Netherlands over the last 20 years has also been very important in support of research by the Institut d'Economie Rurale on soil fertility management in the Sikasso area of Mali Sud and the Office du Niger.

Discussion is currently underway concerning the extent to which SFI-related activities might be brought under the aegis of the broader CCD-NAP, with support from the CCD's Global Mechanism. Two constraints may slow this process. First, the CCD-NAP has been made the responsibility of the Ministry of the Environment, established in 1998, having been separated from the previous Ministry of Rural Development and the Environment. The MDRE, as of now, covers all agricultural issues, the 'E' now standing for water (eau) rather than environment. By contrast, the Ministry of the Environment has responsibility for non-agricultural environmental issues such as management of forests and grazing lands, as well as questions of river and groundwater quality, urban pollution and wildlife conservation. Second, there are a sufficient number of organisations with a strong interest

in the SFI process itself (IFDC, FAO, SG2000) for such a harmonisation of approach to be problematic.

Other major policy initiatives with an impact on soils' management include:

i. Decentralisation

Decentralisation began with the definition of new local authorities, to which representatives were elected in April and May 1999. It is intended that these rural communes have considerable powers to mobilise resources both within their area and from external sources for various development activities. They also have formal rights to manage and allocate rights over resources within the commune area, in consultation with village communities. These new responsibilities may conflict with customary village structures for the management of common village lands, under fallow, used for grazing, and collection of fuelwood. It is unclear, as yet, how the respective powers of communes and villages will be regulated since, on a day to day basis, village level structures continue to be considered the legitimate authority by many rural people. Several innovative projects for the management of collective lands have been under way for some years in an attempt to demonstrate to government the great potential of traditional institutions for management of such resources. Whether the new communes will continue to promote such 'local conventions' remains to be seen. Uncertainty over their respective jurisdictions is important in so far as it concerns rights of access to settle and clear new land, and freedom by incomers to graze animals and dig wells within what was formerly considered village territory. Thus, for example, villagers with considerable reserves of farmland and grazing may see their capacity to control access to this resource wither away.

ii. Land tenure reform

The reform of the *Code domaniale et foncier* is taking place with the reassessment of rights to manage and control access to resources. In 1996, additional legislation² defined the roles and responsibilities of the new government structures from national to local level. It provided for the division of the ownership of land and natural resources into two *domaines*: the *domaine publique* and the *domaine privé*. The *domaine publique* will include rivers, marshes, lakes, aquifers, protected areas and national parks and will continue to be managed by the technical services of the state at national level. The *domaine privé* will consist of land that has already been granted title (largely urban land) and all land that has no title (i.e. it still belongs to the state) consisting almost exclusively of rural land. The ownership and management of the *domaine privé* will devolve to the regional, *cercle* and commune level.

The *code domanial* will identify the public lands to be transferred to the *rural communes*. They will then become responsible for its management and can claim part of the tax proceeds, levied on resource use. It should be noted that decentralisation as such is no guarantee for sustainable resource use. A rural commune, for example, may decide to maximise income from levies on resource exploitation that can conflict with the goal of

² Loi (96-050) portant principes de constitution et de gestion du domaine des collectivités territoriales.

conservation that villagers may have for their land. Under the provisions of the law, rural communes will be responsible for producing a land use plan for their area of jurisdiction (*schéma d'aménagement*) which will zone forest, agricultural, pastoral, wildlife, fishery, 'habitat' and mining areas. Once this has been done, the commune has the right to delegate power to villages, pastoral groups and urban neighbourhoods to manage the resources. The state can also award contracts to private individuals or groups to manage agricultural land. In addition to these planning responsibilities, the communes will have responsibility for managing and resolving tenure disputes and ensuring responsible land use practice.

POLICY PROCESS ISSUES

Key institutions and structures for the agricultural sector

The Ministry of Rural Development and Water is responsible for agriculture, including research (carried out by the regional centres of the Institut d'Economie Rurale - IER), and the extension services (PNVA).

The Ministry of the Environment was created in 1998 and has responsibility for non-agricultural environmental issues such as management of forests and grazing lands, as well as questions of river and groundwater quality, urban pollution and wildlife conservation.

The CMDT is a parastatal with a monopoly on cotton ginning and sales, continues to supply most inputs, support the credit system and support research on cotton. CMDT has a contract with the Ministry of Rural Development and Water for providing more general extension support to farmers in southern Mali.

Key external actors

The World Bank and the International Monetary Fund are key external actors— through structural adjustment programmes from the mid-80s onwards, support to devaluation of the CFA franc and attempts to privatise the CMDT as one of the conditions for the Highly Indebted Poor Countries (HPIC) programme. The World Bank also has its own natural resource management programme (PGRN) which has been pursuing village land management activities in many areas of the country.

The Netherlands have been very important supporters of Mali's agricultural sector, particularly through research support and funding via IER, support to the CMDT and the Office du Niger and elements of the SFI. The French have traditionally been a major donor to Mali as a whole and have supported the cotton and rice sectors as well as the decentralisation process. Germany has been of particular importance in support of the CCD process and the elaboration of the NEAP where they have taken the role of chef de file. They have also played a major role in the PGRN (See Table below for overall donor funding data). In addition, NGOs provide considerable funding for work in Mali, estimated at c. 10% of the total aid budget.

Table 1: Donors currently financing in Mali

Donor 1997-1998	Total commitment to Mali FCFA	Sectors					
		Rural Dev. & Env	Educa- tion	Health	Infra- structure	Private sector	Macro/ inst'l Dev/ Poverty
IDA/WE	211.1 billion	✓✓	✓✓	✓✓	✓✓	✓✓	✓✓
AFDB	89.6 billion	✓✓	✓				✓
Kuwait (1975-1997)	90 m	✓✓	✓		✓		
EU (1998-2002)	124.0 billion	✓			✓✓		✓
France (1996-1997)	47.3 billion	✓	✓	✓	✓	✓	✓
Canada	40.3 billion			✓	✓		✓
Japan	23.9 billion	✓	✓				✓
UNDP (1992-1996)	23.5 billion	✓				✓	✓
USAID	18.1 billion	✓	✓	✓			✓
Netherlands	15.6 billion	✓		✓	✓		✓
WHO	465 m	✓		✓			✓
Switzerland	n/a	✓		✓		✓	✓

NB some total figures are inconsistent with reported sectoral spending figures (e.g. Kuwait and Germany)

✓✓ = over 30bn FCFA.
✓ = less than 15bn FCFA.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

Background research informing policy debates

The policy debate on soil fertility and natural resource management more generally has taken a twin track. On the one hand, a major emphasis is provided by many observers on the significant level and rate of nutrient depletion, and risks to agricultural sustainability from traditional farming practice, over-cultivation, over-grazing, and short-term horizons, due to farmers' impoverishment. Reference is frequently made to a number of key studies. Breman's work highlighted the limiting role of nutrients, even at relatively low levels of rainfall, and the need for external inputs, particularly at the livestock and human densities achieved in the cotton zone (Breman and Traoré, 1987; Breman and Sissoko 1998). Van der Pol's work argued that nutrient depletion constituted a major share of income gained by farmers in southern Mali, yet was being ignored (van der Pol, 1992). Bishop and Allen's study estimated losses to Mali's agricultural GDP due to soil erosion as 13-17% (Bishop and Allen, 1989). Stoorvogel and Smaling's study for FAO provides figures for average losses per hectare of N, P and K per year that have been quoted again and again (Stoorvogel and Smaling, 1990). In the absence of other simple statistics, the same figures are used regularly to emphasise the fragility of farming systems, the short-sightedness of farmers, and/or the need for subsidies to cover increased use of inorganic fertilisers, cattle feed, and improved production and use of organic fertilisers.

On the other hand, research undertaken over the last few years³ has demonstrated the great diversity of soil fertility management at village level, between plots and farmers. Of even greater importance seems to be the broader economic incentives provided by access to markets for inputs and crop sales which provide both an incentive and a means by which farmers can intensify farm production. Such research shows that farmers are remarkably responsive to differences in conditions, changes in prices, and availability of new

³ The Dynamics of soil fertility management, funded by EC/DGXII (see footnote 7).

techniques. Equally, research on soil conservation practice has shown that the methods used by farmers to make best use of limited rainfall and stem evident problems of soil erosion can be remarkably effective⁴. This work is starting to provide the basis for a more tailored approach to support farmer adaptation to new circumstances, which needs further elaboration⁵. It is intended to provide such support through the programme of work described below.

Parallel to the research on soils and degradation, work on tenure and institutions has promoted the need for clarification and strengthening of local resource user rights, through the establishment or strengthening of village committees, or the design of local conventions for collective land management⁶. Government and donors also acknowledge the importance of a 'participatory approach' to the design of interventions at field-level and, increasingly, to the design of higher level policy processes. Examples include the NAP process, the Regional User committees linked to agricultural research centres, and the proposed SFAP consultation process. However, there often remains a major gap between the rhetoric in favour of participation and acknowledgement that local people have much useful knowledge and skills, and the continuing top-down approach to elaboration of legislation, action plans, and project design.

Proposed areas of work on soil fertility management

It is proposed to support a work programme operating at three different levels: commune, region, and national. The primary focus will be at the first of these while results will be fed into policy discussions at higher scale levels. The work will start with a consultation process involving potential collaborators and other stakeholders in the field of soil fertility management.

Commune level: As outlined earlier, Mali has recently held elections for representatives to the newly established *Communes Rurales* (CRs) and *Municipalites*. A range of responsibilities have been assigned to this new level of local government which include: taxation, provision of services (health, education, technical advice), planning of development activities, and management of natural resources (such as through the drafting of a *schéma d'aménagement*, the levy of taxes on permits to exploit woodlands, clear land, etc.). The communes have become the lowest official policy and planning level in Mali. They vary in size depending on the population density and patterns of land use and regroup several villages. Overall, they average 10,000-12,000 people per commune, the rural population of Mali being divided amongst 701 communes. As such they represent a considerable reduction in size by comparison with the previous system of *Arrondissements*.

⁴ Reij, Scoones and Toulmin (1996) *Sustaining the soil*. Earthscan, London.

⁵ See both Scoones and Toulmin (1999) *Policies for soils management in Africa*, and *Draft Resource Guide for soil fertility management* (1999) Defoer et al.

⁶ Hilhorst and Coulibaly, 1999, *Dème*, 1998.

This programme intends to choose five communes spanning a range of settings in which to define a programme of activities tailored to local constraints and needs, in collaboration with partner organisations operating in these areas. The overall purpose is three-fold. To identify a set of activities which support the capacity of communes better to address issues of soils management within a broader livelihoods context, to analyse the role of policy, and to identify those issues which have to be dealt with at higher policy levels, by the private sector or civil society.

Earlier research in Mali has demonstrated the great diversity in soil fertility management practices between locations, between different farmers in a given location, and between the different plots being cultivated. A factor of major importance in explaining the diversity between locations is the ease of access to markets and the existence of a cash crop whose sale provides both an incentive and a means to invest in supplementing soil nutrients with purchased inorganic fertiliser. The greatest difficulties are faced by those farmers in areas where declining fallow and reduced access to grazing have put in jeopardy a farming system based on the transfer of nutrients from bush to fields via livestock. Appendix 4 details the communes selected, and the activities planned.

While this commune level approach will be the primary focus of the programme, it will be supported by work at regional and national level.

At regional level, a permanent forum of organisations and stakeholders with an interest in soil fertility issues will be supported. An initial meeting held in the Segou Region provided considerable debate and opportunities for networking amongst organisations involved in a range of rural development activities. This forum would include all major stakeholders, such as farmers' organisations, NGOs, regional technical services from the ministry of rural development, and ministry of the environment, researchers from the regional research centre, private sector representatives, rural development projects, and credit providers. Such a forum would provide a means for drawing a wider network of actors to support and learn from commune level activities, to identify key policies and priorities for action.

At national level, two parallel processes are currently underway as regards soils and land management – the implementation of the National Action Programme of the Convention to Combat Desertification, and the Soil Fertility Initiative Action Plan. The Global Mechanism of the UNCCD has proposed to facilitate the joint design and implementation of activities under these two processes to maximise areas of synergy, and avoid competition and duplication of activities. This will require collaboration between the relevant ministries (MDRE/SFI and ME/CCD), and closer links between the various donors supporting each of these processes. Such a harmonisation of approaches may be further helped by Mali having been chosen as a candidate for trying out the World Bank's Comprehensive Development Framework approach.

Our proposed programme would maintain a link with these two linked processes with the aim of feeding material on a regular basis from commune level back up to inform national

level policy, thereby providing very practical experience of measures and approaches for possible broader take-up.

Potential partners

The set of proposed activities will need to involve a range of key actors with a mandate for research and extension such as IER, CMDT, MDRE and ME, actors responsible for financial service provision such as BNDA, Kafo jiginew and other savings and credit organisations, actors accompanying the decentralisation process such as la Mission de Décentralisation. Farmers' organisations such as SYCOV and a number of NGOs with extensive experience in soil fertility management will also take part.

It is essential that one relatively neutral organisation which is experienced in organising and facilitating discussions with farmers and other stakeholders will act as a broker and facilitate the process. This will be a NGO (such as SOS Sahel, World Neighbours, CARE, or EDP) as they can operate in a more flexible manner than the government agencies involved. Specific activities such as a research programme will be implemented following a contractual approach. The forums at regional and national level will be convened by a mandated actor who will be provided with assistance for organisation and facilitation.

List of abbreviations

BNDA	Banque Nationale de Développement Agricole
CCD	Convention to Combat Desertification
CFDT	Compagnie Française pour le Développement des Fibres Textiles
CMDT	Compagnie Malienne pour le Développement des Fibres Textiles
IER	Institut d'Economie Rurale
IFDC	International Fertiliser Development Centre
MDRE	Ministère de Développement Rural et de l'Eau
ME	Ministère de l'Environnement
NAP	National Action Programme
NEAP	National Environmental Action Plan
NGO	Non Governmental Organisation
OPAM	Office de Production Agricole du Mali
PGRN	Programme National de Gestion des Ressources Naturelles
PNVA	Programme National de Vulgarisation Agricole
SFAP	Soil Fertility Action Plan
SFI	Soil Fertility Initiative
SYCOV	Syndicat des Producteurs de Coton et Vivriers
UEMOA	Union Economique et Monétaire de l'Afrique de l'Ouest

Appendix 1: Persons consulted

1. Zana Sanogo, Conseiller MDRE/ coordinator SFI
2. Alpha Maiga, Director IER
3. Siaka Dembélé, Scientific coordinator IER
4. Mamadou Doumbia, Soils programme IER
5. Abdoulaye Gakou, Cotton research programme IER
6. Daouda Koné, Farming systems research programme IER-Niono
7. Zana Jean-Luc Sanogo, Farming systems research programme, IER-Sikasso
8. Joep Slaats, Expert KIT, Regional Research Centre in Sikasso
9. Fousseini Togola and Ted Schrader, CMDT
10. Hans Meenink and Cheik Oumar Diarra. Programme d'Appui au Développement des Communes Rurales de Dioila
11. Amadi Coulibaly. Intercooperation/EDP (Environnement -Développement Paysan)- Sikasso
12. Ans van den Akker, Sector specialist environment, Embassy of the Netherlands, Bamako
13. Duncan Fulton, SOS Sahel

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Appendix 3: Contextual information

Mali is a very large landlocked country in the heart of West Africa, covering 1.27m sq km, half of which lies below the 200 mm isohyet. It is transected by two major river basins, the Niger and Senegal and their various tributaries. The bulk of Mali's 10m people live south of the river Niger, in the main farming zone, where rainfall is sufficient in most years to support a harvest. Patterns of population density reflect rainfall to a large extent, with levels as low as 1-2 p/sq km in the northern regions, rising to 50 p/sq km in the region of Mali Sud. Agriculture provides 42% of the country's GDP, some 75% of export revenue and occupies an estimated 80% of the population.

Formerly part of French West Africa, Mali became independent in 1960. A coup d'état in 1968 brought a military government to power that was finally toppled in 1991. Multiparty elections in 1992 and 1997 were won by the party of Alpha Konaré, which has followed a pro-market economic policy, winning the approval of the multilateral and bilateral donors. It is currently in the process of decentralising its administration to newly elected local government authorities at commune level, and is reviewing its Land Tenure Code. Mali shares its currency, the CFA franc, with the other members of the Union Economique et Monetaire de l'Afrique de l'Ouest (UEMOA), which is linked to the French franc. All UEMOA members devalued by 50% in January 1994, with significant impacts on the farm sector.

Mali is identified as 171st of 175 countries on the UNDP's Human Development Index. Per capita income is estimated at approximately \$240 per year (1996), substantially lower than the Sahelian average (\$360), and 70 percent of people live below the poverty line (1996) which is calculated on the basis of caloric intake from main food crops. Only 40 percent of the population have access to basic health services and less than 50 percent have access to safe drinking water. Average life expectancy is 58.5 years⁷. Mali has recently drawn up a comprehensive analysis and strategy for addressing poverty and is currently engaged in a prospective study, called Mali 2025.

Agroecological zones

Mali can be divided into four main areas so far as agricultural production systems are concerned.

i. Mali-Sud is the cotton growing area of the country and is covered by the parastatal organisation, the Compagnie Malienne pour le Développement des Fibres Textiles (CMDT), jointly owned by the Malian government (60%) and the French company the CFDT (40%). Cotton has been promoted since the colonial period, through a range of programmes aimed at farmer adoption of new technologies such as the plough, use of improved varieties and fertilisers, production and use of manure and compost, oxen management, and anti-erosion measures. Cotton provides a major engine of economic development in the southern part of Mali, accounting for a major share of farm income and generating more than 50% of the country's exports. It provides also a source of

⁷ Stratégie nationale de lutte contre la pauvreté, Ministry of Planning, July 1998.

revenue for village-level organisations who handle cotton collection and input supply for the CMDT. Cotton is grown in rotation with cereals (sorghum, maize, millet). Farmers also cultivate groundnuts, and smaller patches of fruit, potatoes, upland rice and vegetables. Cattle are an important component of the farming system, as a means of traction for ploughing, an asset of value, and as provider of organic manure.

Cotton production is becoming less profitable for farmers in the drier part of the cotton zone on the northern edge of Mali Sud, where the crop was first introduced 30-40 years ago. There is now considerable interest in seeing how farmers can diversify away from cotton and into a range of other livelihood activities. At the same time, new areas for cotton production are being opened up by the CMDT through investments in all-weather roads, input supply, extension services and ginneries in the west and southwest of the country.

Cotton farmers have been subject to a number of major changes over recent years, which have affected the way in which they manage their land. First, the CMDT has been the object of attempts by the World Bank to re-structure its functions and liberalise input and cotton markets. Thus, the CMDT no longer covers quite the extensive range of responsibilities which it had formerly, which included provision and transporting of all inputs, access to credit, veterinary services, support to institution building, and so on but they maintained their monopoly on cotton ginneries and marketing. The main impact of liberalisation to date has been changes in credit provision (which has resulted in some problems with debts) and loss of secure access to veterinary health inputs for work oxen. However, proposals for the CMDT's privatisation have recently been revoked (April 99), in favour of greater transparency in the financing and operations of the organisation.

Second, the devaluation led to an increase in the price of inputs, particularly fertilisers, essential to continued cotton harvests. Yields are estimated to have stabilised, if not slightly declined, though it is unclear whether this is due to farmers using less fertiliser, or more significant problems of acidity, pest and diseases. Despite declining yields in established areas, Mali was estimated in 1998/9 to have produced a record harvest of cotton, due to expansion into new areas of production in the west, placing it as the second most important producer in Africa behind Egypt. A number of farmers in southern Mali are now shifting attention to livestock and crops on which they reckon they can derive a higher return, such as maize, fruit, potatoes, rice and vegetables as well as poultry and small ruminants and cattle, which are now all being produced in larger quantity. The devaluation of the CFA franc has opened new markets (particularly in Ivory Coast) and brought higher prices and returns for these products.

ii. The Office du Niger irrigated zone lies to the east of Bamako, along the River Niger and northwards of Segou to Niono. Originally envisaged by the French in the 1930s as a rival to the Gezira cotton scheme in the Sudan, since Independence, the scheme has mainly been producing rice. The Office du Niger covers a total area of 50,000 ha, irrigated by gravity thanks to the Markala Dam on the River Niger. Over the last ten years, a major rehabilitation programme has improved greatly the infrastructure, water management and tenure conditions for farmers on the Office du Niger. In combination with new varieties

and transplanting methods, rice yields have tripled since 1981, to 4.9 t/ha today, with double this figure possible in those areas under double-cropping. Plots are in great demand with people as far away as Bamako gaining tenancies on the Office's lands, but the amount of land available is limited. Incentives to increase rice production received a boost with the de-regulation of cereal markets in the mid-80s, and the devaluation of the CFA franc in 1994, which has improved the market position of Mali's rice farmers in comparison with cheap imports of broken rice from south-east Asia. The privatisation of credit supply and marketing has created debt problems for certain farmers which affects soil fertility management.

Vegetable production is of growing importance within the Office, for markets in Bamako and beyond. Animal holdings include cattle, sheep, goats, and poultry. Herds must be kept some distance from the scheme while crops are in the ground, but after harvest the rice stubble provides a very important dry season grazing resource for the animals both of rice farmers and transhumant groups.

iii. Rainfed agro-pastoral systems. To the north of Mali Sud are found extensive farming systems based on millet, and livestock, with small areas under groundnuts, fonio, and sorghum. These farmers tend to rely largely on fallow and nutrient transfers from pasture to cropland, and oxen drawn ploughs. Long-standing relations between sedentary farmers and herding populations revolve around exchange of dung for access to water, and grazing. However, in many places the reciprocity which marked such exchanges seems to be breaking down, as farmers invest in their own herds, grazing becomes increasingly scarce, and herders themselves want to find land where they can settle and farm.

iv. Pastoral livestock systems dominate the northern half of the country, apart from small areas of cultivated land along the River Niger and in oases. The very low density of population and the low and erratic pattern of rainfall mean that soil moisture is a far more limiting factor than nutrients in the farming that does occur. Livestock are an important sector of the Malian economy, both as source of animals for domestic consumption and export, and also as visitors and providers of manure to farming systems further south. The devaluation of the CFA franc brought higher prices and returns to Sahelian herders, due to the improvement in market demand from coastal countries.

Appendix 4: Detail of proposed programme at the commune level

The following communes may be chosen for this programme of work:

- i. A commune to the north of Niono, within the Office du Niger irrigation scheme, where farmers are producing both rice and an increasingly diverse array of vegetables. Farmers have started mixing inorganic fertiliser with manures and compost to ensure the continued fertility of their land. Emerging difficulties include problems of rising water tables, rice disease, access to credit for purchase of inputs, access to manure and finding an effective balance between vegetable and rice production to prevent alkalinisation while improving soil fertility.

- ii. Doura commune in Segou Region where, until recently, low population density and extensive grazing areas have provided for many farmers the possibility of maintaining soil fertility through nutrient transfers. However, these systems are coming under increasing pressure, with rising occupation of land, and conflicts between herding and farming populations emerging over access to farmland, grazing and water. Particular difficulties arise for those farmers with few or no livestock.
- iii. A commune in the Koutiala area of Sikasso Region, where cotton has been cultivated for several decades. Here, on the northern edge of the cotton zone, yields have been declining and attention has been drawn to areas of diversification away from cotton. At the same time, the substantial levels of population density have brought concerns for the management of collective resources – woodlands, grazing. This has led to the elaboration of local conventions amongst a group of villages, such as in the Siwaa zone, which aim to regulate access and use of common property resources.
- iv. A commune near Bougouni, Sikasso region or near Kita where cotton is still relatively new as a crop, and land is being opened up for cultivation following the sinking of wells, and the eradication of tsetse. Here the particular problems faced by farmers include the adoption and adaptation of new agricultural technologies such as animal traction, use of fertilisers, and crop-livestock integration. The challenge is to promote intensification of land use and resist the temptation for using more extensive forms of land use. These are the last regions in Mali which still have large areas of woodlands which support high levels of biodiversity.
- v. A peri-urban rural commune on the north west edge of Bamako. As with all peri-urban areas, farmland is coming under heavy pressure for conversion to alternative uses. At the same time the proximity of urban markets provides a considerable opportunity for higher value crops. Access to urban wastes constitutes a valuable resource for maintenance of soil fertility, though some problems exist regarding the suitability and qualities of such waste materials.

The precise number of communes chosen remains to be decided.

Activities at commune level

- i. *Management of soils on-farm.* Work at commune level will begin with the identification of what farmers in different settings and situations are doing, where their priorities lie, and the opportunities currently open to them for improving the quality of their land from both a technical and an economic point of view. This process of diagnosis and selection of priority themes and areas will be done in collaboration with an NGO working in the area, able to act as broker between the various stakeholder groups (such as contacts with the regional research centre, traders, credit institutions), and give support to technical services. It is expected that this process will lead to the selection of several techniques for improving soils management, where farmer groups and exchange visits between sites will allow for farmer-level testing and evaluation of options. This programme of activity will be

undertaken in close collaboration with the technical agent based at commune level, with a view to demonstrating an alternative approach to agricultural extension based on learning from and with farmers, rather than the more traditional training and visit model, which has tended to dominate the national extension programme. Focus on farmer practice and support to farmer learning will be aided by use of the Resource Guide developed during the earlier Dynamics of Soil Fertility Management programme⁸.

- ii. *Markets, prices and livelihood options.* Issues relating to soils management cannot be dealt with in isolation from broader livelihood issues, alternative uses of labour, capital and land, and the institutions through which people gain access to these resources. Hence, this element of the work programme will identify the particular challenges facing farmers in terms of access to key resources, and most particularly issues relating to natural resources, credit, markets, price variation, and the development of new crop and market opportunities. The private sector has become of increasing importance throughout Mali in both the delivery of inputs and the collection and transport of crops for sale in distant markets. Credit for input purchases (seeds, fertiliser, pesticides) is frequently linked to crop delivery at harvest time (not only with cotton and the CMDT, but also rice, and vegetables). Work at commune level will identify current problems with access to natural resources, access to sources of credit for farmers, ways of improving access to finance through NGO or private sector operators, and improvements to systems of marketing and transport that would provide better returns to farmers for crops sold. The role that can be played by local government, village and farmers' organisations, private sector and other relevant stakeholders groups in improving access will be then be identified.
- iii. *Management of common property resources.* Soils management needs to be seen within the broader context of natural resource management at village and commune levels. The new decentralised communes have formal control over common property resources within their area allowing them to allocate permits for wood-cutting, rights to dig wells, and land to cultivate. Management of resources is subject to overlapping systems, comprising customary management at village level through traditional councils made up of first settlers, land tenure codes which allocate powers to the state to manage and allocate rights to resources, and the powers to be exercised by rural communes. The commune may rely, to a large extent, on day to day management by village councils, but there is increasing uncertainty and concern regarding the possible tensions between customary and statutory authority in this field. In response, some villages have formed associations and drawn up rules (in the form of a local convention), submitted for approval by the local administration. It is unclear how far these conventions will continue to be respected following the take-up of powers by the communes and if they will stimulate the formulation of other conventions within the commune or across neighbouring communes, particularly where resources of considerable value

⁸ Co-ordinated by IIED and IDS, with partners in the Netherlands (KIT), Mali (IER), Zimbabwe (FSRU-DRSS), and Ethiopia (FARM Africa).

are at stake. This element of the work programme would seek to follow and document how customary and statutory powers interact over the next few years. It would also examine the impacts on natural resource management and use of both decentralisation, and forthcoming revision of land tenure codes which aim at providing greater powers to customary structures.

Work to support more effective soil fertility management practices in these five communes builds on a strong network of partnerships with national and local organisations. It will permit:

- i. the demonstration in practice of the need for diverse and tailored approaches appropriate to different settings,
- ii. a testing out of methods for exchange and learning between different stakeholders at commune and regional levels,
- iii. the identification of key policies issues
- iv. a testing of approaches to link local, regional and national levels through scaling up of results from farm and commune level to higher units of analysis and policy decision making
- v. the provision of practical guidance to national level structures responsible for the broader soil fertility action plan.

SECTION 2
COUNTRY REPORTS

NIGERIA

2.4 NIGERIA⁹

Peter Brinn

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Nigeria is a nation of smallholders, with an average of less than 2ha per family. A population growth rate of 3% p.a. has local implications for traditional methods of soil fertility restoration based on fallow, as suitable land outside the cultivation cycle is limited. In certain regions expansion of the area under cultivation can only be made at the expense of the fallow period. Under current practices this results in declining yields per unit area.

The country is becoming increasingly deficient in food and industrial raw materials due to the high population growth rate and very slow rate of growth in agricultural output and productivity. Agriculture's share of GDP fell from 63% in 1960 to 30% in 1990 and it contributes a declining share in total export earnings (less than 25% of total export earnings is derived from agricultural exports). A deteriorating food self-sufficiency ratio is resulting in high rates of food price inflation.

It is estimated that 75% of Nigeria's land area is cultivable, about half of which is currently used. Increasing rainfall from the semi-arid north to the tropical rainforest south allows great crop diversity. Short-season cereals, sorghum, millet and some wheat dominate the north, with cassava, yams and rice in the wetter areas. In the dryer regions cash crops include cotton, groundnuts and tobacco, while in the south cocoa, rubber, oil palm, coffee, sugar and ginger are grown. There are a number of large irrigation schemes in the north.

Traditional land tenure systems vary throughout the country with northern systems being influenced by Islam and southern systems being based upon long-term usufruct of communal land. Usufructs are however being converted into *de facto* freehold, and land markets are developing in some areas. This situation provides incentives for excessive clearance of woodland and allowing the growth of speculative markets in some areas to the detriment of poor farmers. The need to protect customary rights of users/owners to facilitate the constructive evolution of the customary land system towards increasingly individualised and permanent ownership and the return of management responsibility for communal resources to local user groups has been highlighted.

⁹ See Appendix 4 for contextual material on Nigeria

SOIL FERTILITY MANAGEMENT INTERVENTIONS

Soil fertility concerns

A World Bank Environmental Assessment report for Nigeria (1990) identified land degradation as the most important environmental problem facing the country, in terms of its economic significance, the area of land and the number people it affects.

A more recent (1997) farmer survey in northern Nigeria attempted to identify the main farmer perceived limitations for crop production. In decreasing importance these were – fertiliser availability and cost (with cost less important); insect infestation; drought; lack of access to roads; non-availability of machinery and weed infestation. For farmers the causes of poor yield can be categorised into those most important at present and those that are expected to increase or decrease with time. Lack of fertiliser and *Striga* were perceived as the main causes of poor yields by 88% of farmers. Lack of fertilisers was the only cause of poor yield which farmers believe will grow worse. When asked what they would like to have in order to improve their farming, farmers listed fertiliser, the use of tractors and availability of bank loans in order of preference.

There was universal agreement amongst all key informants consulted during this study that low (and declining) soil fertility, manifested in reduced productivity of food crops is a priority, if not the priority concern, for resource-limited farmers in Benue State.

Declining soil fertility is actively discussed by farmers, researchers, extension organisations and referred to in agricultural policies, but there is little action at field level. Fertiliser is seen as a panacea, and the answer to many soil fertility problems.

Fertiliser distribution has recently been privatised but problems exist in ensuring the right quantities get to the right places and shortages have led to increased prices. We were consistently informed that inorganic fertiliser supply and subsidy is an important, if not the most important (and therefore political) rural issue in Nigeria today. The former policy of fertiliser subsidy and promotion, despite being condemned as inefficient and corrupt, enabled a large proportion of Nigerian farmers to experience the benefits of fertiliser use. The removal of subsidy in 1997, the increase in price, and supply problems have massively reduced fertiliser use since then. Many farmers apparently see fertiliser as the solution to their soil fertility problems and subsidy as the only means of making it accessible. The new administration has reintroduced a 25% subsidy on fertiliser. No commitment has been made about the level of state involvement in procurement and distribution as yet. The long-standing fertiliser division of the ministry (FPDD) has now been upgraded to status of a Fertiliser Department. This probably indicates an increased role of government in the sector and a major policy reversal.

Incentives to manage soil fertility

The wide availability of subsidised fertiliser during the 1970-80s, although inefficient and corrupt did provide a powerful demonstration of the impact of fertilisers on crop

production across a wide section of society. The current political changes have resulted in an expectation of a return to some form of subsidised fertiliser provision. This expectation may be ill founded but if widely held it could reduce interest in and enthusiasm for non-fertiliser based soil fertility interventions.

The engagement of State and Federal institutions in the concerns of the most vulnerable rural groups, if realised, represents relatively uncharted territory for Nigeria. The impact of new approaches will depend on the organisation of institutional change and the time scale within which they can be realistically implemented. The confidence of communities will have to be won.

Initiatives of relevance to soil fertility management

In 1987 government formally introduced specific agricultural policy initiatives. These were intended to accelerate agricultural production, provide price incentives, credit, export facilities, better access to markets and improved infrastructure to encourage rural enterprises. It is acknowledged that these initiatives had limited impact. Inadequate attention was paid to the interaction between macroeconomic and sectoral policies, often resulting in transmitting conflicting signals to farmers, eliciting a poor or even negative response.

Various attempts to address the problems of land resource degradation have been made by farmers and their traditional leaders and by successive governments. Research institutions have examined approaches, which hold some promise of reducing soil loss and fertility decline. The scale on which these remedies have been successfully applied, however has been small in relation to the problems.

Technically appropriate, socially acceptable and economically viable solutions to fertility problems caused by declining fallow periods have not been adequately addressed. A World Bank fertiliser sector mission in 1989 highlighted the impact on soil fertility posed by reduced fallow periods and the critical role played by organic matter in sustaining productivity. While planted fallow, cover crops, alley cropping, mulching, minimum tillage and crop rotations had an important role in increasing organic matter, they all had limitations, especially because of their demands on labour. The mission concluded that there was no alternative to the use of inorganic fertilisers as a source of nutrients for productive annual cropping. Attempts to control soil degradation and fertility decline are described on a zonal basis in Appendix 5.

Agricultural Services

The primary providers of agricultural services in Nigeria are the Agricultural Development Projects (ADP). The ADPs operate a training and visit extension system with village extension agents. Surveys suggest that the majority of farmers seldom see an extension agent with contact confined to comparatively wealthy farmers. Advice where available is linked to relatively expensive inputs which are not available to the poorest farmers. The ability of the ADPs to deliver agricultural services is currently constrained due to significantly reduced financial resources due to the expiry of the WB loan. In addition

Local Government Authorities (LGAs¹⁰) have agricultural departments but their ability to deliver services is also constrained by a lack of resources and training.

In 1994 the National Agricultural Research Project (NARP) was launched with WB support. As part of this a National Agricultural Research Strategy Plan was developed with the following principles –

- Adoption of a participatory approach, based on full involvement of scientists from the national agricultural research institutes, universities, international research centres and other relevant organisations, research managers, extension agents, stakeholders and users of technology
- Enlargement of the scope of the research strategy to include policy research in order to promote synergy between technical developments and government policy at micro and macro levels.
- Focus on small and medium-scale producers.

Specific initiatives

IFAD works in Benue through its Cassava and Root Crops Project. This involves multiplication of planting materials, pest control and processing.

The National Fadama Development Project funds specific irrigation-related activities. The National Agricultural Technology Support Project provides limited funds for technology transfer and liaison with national research institutes.

The DFID supported project “Improved Farmer Participation in Research and Extension in Benue State” (IFPREB) recently commenced activities in collaboration with the Co-operative Extension Centre (CEC) of the University of Agriculture, Makurdi. The project purpose is -“enhanced ability of agricultural research, training and development agencies to meet information and skills needs of resource poor farmers, particularly women” (see later Section on Potential policy development activities)

Nigerian Soil Fertility Initiative (SFI) activities

The Nigerian SFI is being implemented within the overall National Agricultural Research Project (NARP) specifically within the Soil and Water Management Research (SWMR) component. A national SFI workshop was held in January 1998 during which participants endorsed the following decisions :

- i. High priority to be given to SWMR including the establishment of zonal coordinators and a National Steering Committee. The NCRP on SWMR should be revised and a well-balanced programme should be developed in consultation with zonal NARI's, FDALR, ADPs and farmers. The focus should be Sustainable Land Management (SLM) technologies such as minimum/no-tillage and living/ dead mulch, soil recapitalisation with P.

¹⁰ See Appendix 4 on section entitled ‘Institutional setting – formal’ for information on Nigeria’s geo-political structure.

- ii. The SWMR should contribute to the Desertification Convention, which has been ratified by Nigeria and plays a lead role in submission of Land Degradation/Land Management projects to the GEF.
- iii. The SWMR is developed along three categories of “Management Systems”: Soil and Water Conservation; Soil Fertility Management and Land Evaluation.
- iv. In addition to the generation of new technologies toward increased sustainability it was agreed that the zonal institutes take leadership in SWMR and in collaboration with other partners develop annual workplans with a focus on adaptive research with ADP’s, local government, traditional leaders and the private sector.
- v. It is recognised that there is an urgent need to develop a sound data information system related to SWMR and to identify cost-effective impact indicators on the quality and productivity of soil and water resources.

The Nigerian Land Information Network (NLIN) was convened in response to this fifth decision and this has become a priority focus of the Nigerian SFI. The NLIN aims to -

- i. Identify available sources of land related information for monitoring and evaluation of land quality (soil, water, land management and biological resources).
- ii. Develop a framework for an information network (institutional, functional and scientific) such as to optimise the investments required for an operational and financially sustainable NLIN.
- iii. Identify resources required (institutional, human, equipment and financial) to strengthen existing institutions and develop new capability for information analysis including system simulation and modelling for monitoring changes in land quality.
- iv. Develop an action plan to implement a pilot phase of this new land information network including objectives, activities, responsibilities, capacity building and a budget.

Currently progress with the SFI is limited, as with many initiatives in Nigeria because of the political transition. Given the agro-ecological variation the decision to develop zonal action plans is an appropriate approach. The close World Bank involvement with the NARP means that it is difficult and probably not appropriate to distinguish SFI activities from other NARP activities. It is widely recognised that Nigerian agricultural research institutions need to improve research-farmer linkages. Without a significant shift of emphasis towards the needs of the resource poor farmers the impact of SFI related activity is likely to be local.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

Key Government Departments and Players

The institutional context is framed within Federal¹¹ and State institutions, with some overlapping responsibility. Nigeria has 18 National Agricultural Research Institutes, 23 faculties of agriculture and veterinary medicine and three Agricultural Universities. Five international agricultural research centres operate in Nigeria. IITA is based in Nigeria; ICRISAT, ILRI, IRRI and WARDA all have stations based in Nigeria.

At State level, each of the 36 States has an Agricultural Development Project (ADP) which refers both to a specific World Bank project and the institutions set up to implement it. The ADP is the key executive wing of the state Ministry of Agriculture and Natural Resources, although there is extensive federal advisory support and co-ordination of ADPs. The State Governor chairs the ADP Executive Committee with State Commissioners, federal institutions and the State Implementing Agency. The State Commissioner for Agriculture is the most important (political) player at state level. He chairs the State project Co-ordinating Committee composed of Heads of Departments and Parastatals and reports directly to the Governor.

Tensions exist between Federal and State Institutions with considerable variation in influence depending on locality and sector.

Government policy on the environment and agriculture

At a Governmental level the environmental and agricultural sectors have traditionally been neglected in comparison with the petroleum sector.

After the oil price leapt in the 1970s, many amongst the professional middle classes devoted themselves to getting government contracts and licences to import goods, while the oil-driven, high-valued currency undermined Nigeria's traditional agricultural exports of cocoa, cotton and groundnuts. The incomes from agriculture of millions of rural households were quickly depleted.

There is a wide range of legislation that potentially impacts on the natural resource sector, but the majority of these laws are not enforced. The Land Use decree of 1978, gives power to the state to expropriate land, but fails to give sufficient incentives in the form of freehold for more secure tenure and a rural market in land. The Decree was intended to place land tenure and land use on a uniform basis throughout the country. The Decree recognised occupation of land according to customary tenure, with a right to use that could be inherited, and provided for a tenancy registration process and the issue of a Certificate of Occupancy. The Decree also vested the ownership of all land in the state. State

¹¹ The key Federal institutions serving the Natural Resources sector are: Federal Ministry of Agriculture and Natural Resources, Federal Ministry of Water Resources and Rural Development, Federal Environmental Protection Agency, Federal Ministry of Science and Technology, Federal Ministry of Finance and Economic Development, Federal Ministry of Industries.

governments can allocate land for large-scale farming subject to acceptance by the affected local communities. The legislation is biased towards land for agriculture and does not encourage individual or corporate investment in forestry or animal husbandry.

The Water Resources Decree was gazetted in 1993. This provides the legal basis for federal responsibility, and also includes hydroelectric energy, the protection of inland and estuarine fisheries, flora and fauna, the effect on the environment of development proposals and the establishment of a licensing system.

The Endangered Species (Control on International Trade and Tariff) Decree No.11 was promulgated in 1985. This implements the Convention on International Trade in endangered Species (CITES) and gives additional protection to native species.

The role of regionalisation/decentralisation in the policy-making process

High priority is currently being given to strengthening the role of the Local Governmental Authorities (LGAs) - Decentralisation and capacity building at LGA level is linked to the IMF programme which aims to increase budget flows to the LGAs' initiatives.

The delta issue is prompting some reflections on Nigeria's federal structure. Under military rule, the number of states was increased from 19 to 36, but this was not accompanied by real devolution of resources and authority from the centre. A view is now emerging, at least in the south, that Nigeria should be allowed to develop as six regions: north-east, north-west, middle belt, south-west, south-east and the delta, called south-south. A new administration could transfer funds and power to these regions and allow the present States to become provinces within them, with local government functions.

Likewise, due to the situation in the delta zone, the new government may need to reconsider not only land law which designates all minerals as government property, but also the distribution of revenue from natural resources. Although oil revenue is the primary consideration, lessons from the anticipated process will be relevant to other areas including soil fertility management.

Farmer services are the responsibility of various institutions at various levels. Services vary greatly in quality depending on the level of funding and support in each state. The unification of extension services is being attempted but well articulated co-ordination mechanisms will require clear policy guidance.

The role of donors

International concern on Nigeria's respect for human rights led to the EU taking a Common Position on relations with the Federal Government of Nigeria, whereby in 1996 member states no longer made funds available to the Government. Bilateral and multilateral aid to Nigeria almost ceased with nearly all major donors withdrawing. Amongst those that remained in some (generally limited scale) activities were the WB,

UNICEF and DFID, the latter through mechanisms to assist poor Nigerians without making funds available to the Federal Government.

The IMF is currently negotiating an economic reform programme for Nigeria, the outcome on which will determine renegotiation of Nigeria's \$31 billion debt. In the meantime the Bank, which has had minimal contact with Nigeria since 1993, is attempting to co-ordinate donor support.

The role of NGOs, broader civil society and the media in the policy-making process

There are a very large number of NGOs in Nigeria. Many are newly established and of uncertain status. The term "NGO" incorporates great diversity with little sectoral specialisation in RNR. NGOs with "grassroots" operations place a strong emphasis on community development, participation and group approaches. Most NGOs working in rural areas have a poverty focus, however few appear to have carried out a detailed analysis of community needs beyond an informal consultation process. The most effective NGOs are involved in credit, processing and small businesses.

Improved support for low-input, sustainable agriculture and technical training for NGO staff in low-input approaches and participatory on-farm adaptive research was a key recommendation of a recent study.

There is generally a poor link between NGO agricultural activities and State agricultural departments and no mechanism for joint planning or exchange of information. Input into any policy process is embryonic.

Technical/research, administrative and management capacity

Centres of policy expertise include:

The National Institute for Social and Economic Research (NISER), Ibadan
Development Policy Centre, Ibadan.
Claude Ake's Centre, Port Harcourt.
Centre for Economic Studies, Zaria.

Amongst these, NISER has a relatively high profile and reputation.

POLICY PROCESS ISSUES

Capacity for facilitating a participatory policy process

Political isolation combined with military rule has limited participatory processes compared to other countries in the region. This has also resulted in an imbalance between technical agricultural research and research skills on socio-economic issues. Capacity is currently being developed.

Todd (1994) noted the persistence of traditional political structures in Nigeria. These are largely viewed as benign, but despite this rural societies are increasingly differentiated by wealth. Such differentiation, combined with the individualisation of land tenure, carries a risk that the benefits of development will be tapped by rural elites and that participatory planning of development will be frustrated. The experience of DFID projects in Nigeria is instructive. Health sector experience has shown that despite large rural wealth differences societies may be highly egalitarian and kin orientated in their outlook.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

Context - Benue Co-operative Extension Centre (CEC)/Improved Farmer Participation in Research and Extension in Benue State (IFPREB) Collaborators

Meetings with Enjema and Ai-Inamu communities in Benue State reconfirmed CEC/IFPREB PRA findings that declining productivity of food crops, attributed to declining soil fertility, was a priority community concern.

Field visits confirmed that yields were very low for cassava grown on very coarse textured acidic soils derived from sedimentary sandstones, without adequate fallow periods. The soils derived from these sandstones are extensive in Benue. Their inherent fertility is very low, they have very low reserves of weatherable minerals and because of their low clay content, low capacity to retain nutrients. In an undisturbed state the majority of these soils' "fertility" is associated with their organic matter fraction.

Where tree and perennial crops dominate, soil organic matter levels are not reduced and these systems are appropriate and sustainable (although their management could inevitably be improved). The soil fertility problems are associated with the clearance of vegetative cover for the cultivation of food crops, mainly cassava with a declining proportion of yam. Legumes, mainly cowpea with less pigeon pea, are grown in complex intercropping patterns but apparently in insufficient quantity to counter-act the fertility decline. Long fallow was the traditional practice of restoring fertility but a growing rural population has increased pressure on available land resources and reduced the fallow period. The clearance necessary for the cultivation of cassava reduces the organic matter (OM) content of the soil rapidly through mineralisation and oxidation. The cultivation of cassava does not include any practices to replace the OM lost by these processes. The nutrient equation is thus unbalanced and unsustainable.

Visits to various institutions involved in natural resource management in Benue (state and federal) confirmed that very little research had been carried out with a specific focus on farmers who only have access to sandy infertile soils and very limited resources to tackle the problem. The majority of research has been focused on farmers with better quality natural resources and greater resources. This has been compounded by the limited funding available for agricultural research in general. Policy studies to support the transition were identified as important.

Proposal

A joint proposal is currently being developed by NRI and the Department of Agricultural Economics of the University of Murkurdi, led by Dr. Gbolagade Ayoola, which is to be put forward for phase II of the Soil Fertility Management project. This seeks to analyse the policy environment surrounding soil fertility issues in the country, in the functional, institutional and grassroots contexts with the view to making inputs to IFPREB in providing solutions to the sites. The immediate objectives of the study are as follows:

- To characterise the physical, economic and social environment for soil fertility management against the need to inform a farmer focused, participatory action research process,
- To identify policy factors affecting the nutritional status of the soil at the micro (local), meso (state) and macro (national) levels and links between them with a view to developing a new scope for sustainable soil fertility management,
- To establish the links between field and community level activities for upgrading the fertility of soils on the one hand and the policy level actions and interventions for social and economic development on the other,
- To address the policy and economic implications of the results in relation to national and international programmes for sustainable livelihoods.

A methodology and time-scale for the study are currently under development.

Appendix 1: Persons consulted

1. Daniel Adedzwa, Director Co-operative Extension Centre and CEC STAFF
2. Andrew de Jode, RNR Sector Co-ordinator, DFID, Kaduna
3. A. K. Grema, Assistant RNR Sector Co-ordinator, DFID, Kaduna
4. K. Gager, Project Manager, IFPREB
5. J. Harvey, Advisor, DFID, UK
6. G. B. Ayoola (Former) Director of the Centre for Food and Agricultural Strategy and Head of the Agricultural Economics Dept, University of Agriculture, Makurdi.
7. Prof B.A. Kulu, Farming Systems Agronomist, University of Agriculture, Makurdi.
8. A.A. Ochigbo, Hon. Commissioner, Ministry of Agriculture and Natural Resources, Benue State.
9. Deputy Programme Manager, BANARDA.
10. M.S. Adegoye, Dept of Soil Science, University of Agriculture, Makurdi.
11. J.Y. Odiba, Dept of Animal Science, University of Agriculture, Makurdi.
12. J. Sumburg, University of East Anglia.
13. Geoff Dorman, IFPREB
14. P.S. Oseji, Land Resources, Federal Dept of Agriculture, Makurdi.
15. M.A. Ekwoanya, Dept of Soil Science, University of Agriculture, Makurdi

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Appendix 3: Nigerian NGOs with a specific interest in soil fertility or policy experience.

NAME	Contact	Date Established	Objectives
Nigerian Conservation Foundation	Mrs Uzo Egbuche 5, Mosely Rd, Ikoyi, Lagos	1980	Encouraging and assisting policy in integrated conservation and development
Nigerian Environmental Study Team (NEST).	Prof David Okali 27 Aare Av, New Bodija, Ibadan UIPO, Box 22025.	1987	Policy research, advocacy, awareness raising and grassroots activities in environment and sustainable development.
Population, Environment & Development Agency (PEDA)	Emmanuel Omomoh 7, Murtala Mohammed Way. PO Box 6117, Jos, Plateau State	1991	Environmental resource management. Information, education and communication on population, resources, environment and development. Training of farmers on soil improvement.
Sustainable Agricultural, Rural and Environmental Development (SARED)	Dr LSO Ene. 49, Neni St, Ogui New Layout, Enugu	1995	Rural conservation, organising and assisting to organise rural/farmer groups on permaculture and organic farming

Appendix 4: Contextual Material

Geographic features

Nigeria can be usefully divided into eight agro-ecological zones that reflect increasing rainfall from north to south. The length of the wet season varies from 90 days in the north to 360 in the south. Six of these zones represent latitudinal divisions of the low-relief land surface in accordance with gradual climate and vegetation changes, and two smaller areas of greater elevation rising to over 1000m.

Soils are as diverse as the climate. Many soils are derived from recent windborne or alluvial material. The soils are predominantly coarse textured, low in organic matter with low inherent fertility particularly in the very humid zone. Reported crop nutrient deficiencies include nitrogen, phosphate, sulphur and boron. Acid soils in humid zones may suffer from excess aluminium.

Farming systems

The dominant farming systems are closely related to the agro-ecological zone. These are the:

- Semi-arid zone - *subsistence, short season millet and pastoralism.*
- Dry-sub-humid zone - *subsistence mixed cropping and pastoralism.*
- Sub-humid zone - *subsistence with mixed cropping – cereals, roots and pastoralism.*

- Humid zone - *subsistence, mixed cropping, pastoralism.*
- Very humid zone - *tree crops, root crops and forestry.*
- Flood/swamp zone - *paddy rice, mangrove utilisation.*
- Plateau zone - *subsistence mixed cropping, pastoralism.*
- Montane zone - *pastoralism, subsistence, ranching.*

Institutional setting – formal

Nigeria is divided into 36 states, plus Abuja. Each state is divided into Local Government Authorities (LGA) of which there are over 700 in total. The formal institutional context is framed within both Federal and State institutions, apparently with some overlapping responsibility.

Institutional setting – informal

There are a very large number of NGOs in Nigeria. Many are newly established and of uncertain status. The term “NGO” incorporates great diversity with little specialisation in the natural resources sector. See Appendix 3.

Institutional setting – market

The Nigerian economy is dominated by the oil sector. This has a tendency to have adverse consequences on equality because oil exports create little employment, but cause exchange rate appreciation which damages the competitiveness of other sectors and hence the livelihoods of those that depend upon them. The situation has been compounded by the creation of an elite through the misuse of oil revenues to little national benefit, further compounded by then incurring massive debts when declining oil prices reduced revenues.

Political perspectives

Although the Government appears genuinely committed to the transition to democratic rule and has embarked on several ambitious anti-corruption reforms, it is widely considered that in the early stages at least the emergent system will lack the power to challenge the economic interests of some of those who benefited under previous regimes. The situation is well understood by many Nigerians, and both the problems and policy measures needed to address the situation frequently articulated. Despite this, there seems to be limited pressure from civil society to hold institutions to account. Most observers agree that the pressure for reform must come from more insistent internal demands for change, to give some priority to promoting economic growth and a less unequal division of the benefits.

Resource allocation

Public investment has been dominated by large projects which often failed to be completed, or which were inefficiently operated for lack of adequate recurrent budgets.

Inefficiencies were considered by some observers not to be the result of inept management but the engineering of shortages for private gain.

Where effective poverty reduction programmes exist they are at present largely the result of NGO interactions with communities. It is possible that deeper Government budget cuts required in the future will not primarily impact on the very poor, because they do not at present receive significant benefits from Government funding. Conversely, general support through programme aid is unlikely to benefit the poor unless effective mechanisms for targeting resources to the poor are developed.

The state of the oil economy determines much of what happens in other sectors of the economy particularly agriculture. It has been difficult for agriculture, neglected during the oil boom time, to make up for lost investment and research and to absorb surplus labour generated by the decline of the oil sector.

Opportunities and risks

The economy was expected to shrink by more than 1% in 1999. After debt repayments and in paying wages of the public sector (civilian and military) and investment in oil, there will be little scope for public investment. Any decline in the oil price will worsen the macro-economic situation.

Privatisation could potentially deliver some benefits to the poor. The current policy on privatisation is to ensure that the process is irreversible. Privatisation of the power and telecommunication utilities is important and raises the most difficult issues. By comparison the imminent Fertiliser Corporation privatisation is relatively straightforward, although the timetable for completion is optimistic. But selling at this time would bring in less than the government might wish, and privatisation is still politically unpopular in Nigeria.

The informal sector is very important, especially for the livelihoods of the poor, and entrepreneurship is a part of Nigeria's human resource. Interventions to support capacity building at community level, especially where linked to efforts to empower communities to make demands on Government services and hold services providers accountable are receiving some attention. Decentralisation and capacity building at LGA level linked to the IMF programme which aims to increase budget flows to the LGAs are promising initiatives.

Better information flow on the extent of poverty will help in focusing more attention. Poverty assessment work, together with support to fora to discuss and disseminate information on key policy issues and to raise awareness on how other countries have tackled them are recognised as priority concerns.

In the current circumstances it is important to ensure that development assistance organisations conserve their wish to identify new initiatives with a deeper understanding

of what is possible and sustainable in the current situation. Absorptive capacity, quality and sustainability issues must be addressed.

Appendix 5: Attempts to control soil degradation and fertility decline, defined by zone

Very humid zone

Indigenous - *South west -Oyo system – 2 years cropping 7 years fallow, (becoming unsustainable with population increases) Mbaise, Imo State – Dactyladenia barteri planted fallow, this is pruned for fodder, firewood, mulch and coppiced for yam stakes. Multi story farms- systems that include tree crops, perennial and annual crops.*

Institutional - *Moor Plantation and IITA- cover crops; mulching and zero tillage; alley cropping; alley cropping with small ruminants. Success has been limited mainly because of labour, land tenure constraints and questions over longer-term sustainability. The WB assisted Livestock Project aimed at extending alley cropping with small ruminants to 15,000 farmers.*

Sub-humid zone

Indigenous – *In the Kaduna area these include ridge planting; mixed cropping and the “ring system” where organic manure and household waste are applied to the “inner ring”, while the “outer ring” fields are under fallow (Norman et al 1982).*

Institutional - *Before 1980 construction of broad-based terraces on state farms, this has since been abandoned. The problems of small farmers were not addressed in this programme.*

Dry-sub-humid zone

Indigenous – *Close-settled zones around the main cities are integrated crop, livestock agro-forestry systems, continuous cultivation being achieved by the use of FYM and household wastes. Mortimore (1990) believes the system to be viable.*

Soil conservation by Zuru area farmers, Sokoto State use stone and brushwood on the contour to control run-off.

Institutional – *Mixed farming, introduction of livestock since 1928; Tractor Hire Units; mineral fertiliser supply was initiated in the 1950's programme dogged by shortages, erratic delivery and costs.*

Examples of recent technology initiatives include -

Very Humid Zone, Imo State – *Mbaise area – Introduction of leguminous shrubs into indigenous alley type system (Dactyladenia) plus inorganic fertiliser ; alley cropping in out-fields. Anambra State – Mmaka area- modified Fanya Juu terracing and vetiver grass contour hedges.*

Sub Humid Zone, Kaduna State – Kaduna area- intercropping with Stylosanthes. Mixed farming animal traction; mixed farming and fodder bank rotations

SECTION 2
COUNTRY REPORTS

MALAWI

2.5 MALAWI

Andrew Dorward and Alistair Sutherland

This report presents findings following a visit to Malawi from 10th to 17th March 1999, with modifications after feedback on a draft report. Information was gathered during consultation with a wide range of individuals and organisations (see appendix 1). Key documents are listed in appendix 2. The report was circulated to the stakeholders consulted in Malawi in order to validate the information in the report, to obtain feedback and comment on its contents, and to stimulate discussion on how the issues raised might be addressed, and has been amended in the light of comments received.

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Rural livelihoods in Malawi have been and are affected by a number of mutually reinforcing adverse trends and events. Continuing population growth, with limited growth in the non-agricultural sectors of the economy, places increasing demands on smallholder agriculture. Land pressure is increasing, farm size declining with increased cultivation of marginal lands. Continuous cultivation of maize, generally without organic or inorganic fertilisers, has led to declining soil fertility, with some combination of loss of soil structure, increased run off and erosion, reduced soil moisture retention, and reduced nutrient (especially nitrogen) availability for crops. This in turn has led to declining yields, and increasing food insecurity and poverty, particularly in the more densely populated southern part of the country. Poor economic performance and devaluation of the Malawi Kwacha has led to dramatic increases in the costs of imported fertilisers, such that there are often only marginal benefits (and consequent significant risks of loss) in applying fertiliser to maize produced for sale. Rises in the price of maize that render fertiliser application more profitable make maize purchases more expensive and thus have a negative impact on food deficit households, and on those who sell at harvest time when prices are low and repurchase later when prices are high. Female-headed households are disproportionately represented amongst these disadvantaged households. Failures in liberalised input and output markets and the breakdown of the formal smallholder credit system have further depressed smallholder agriculture, with private traders often slow to move into rural areas and farmers obtaining very poor prices for maize sales at harvest time. Some commentators suggest that some crop diversification is occurring. Increasing prevalence of AIDS and related disease is expected to increase the ratio of dependants to economically active adults in rural areas.

SOIL FERTILITY MANAGEMENT INTERVENTIONS

Interventions directly addressing soil fertility management include agricultural research and extension, community based projects, free input distribution, and input supply and finance services. Interventions can be described in terms of their emphasis on soil and water conservation, inorganic fertiliser use, and/or organic soil and crop management.

Historically there has been a tendency to treat these separately, but there is now increasing emphasis on their integration.

Research has been carried out by a number of organisations. These include the Department of Agricultural Research and Technical Services (DARTS) and Land Resources Conservation Department (LRCD) of the Ministry of Agriculture and Irrigation (MAI), by Bunda College of Agriculture, Malawi Agroforestry Extension Project (MAFE), ICRAF and ICRISAT. These organisations have been working together in the Maize Productivity Task Force which has successfully carried out 2,000 trials throughout Malawi in 1995/96 and in 1997/98 to determine economically appropriate area specific inorganic fertiliser recommendations and is now testing 'best bet' organic options. The Rockefeller Foundation has provided long term support to soil fertility research, networking and capacity building. A National Agroforestry Steering Committee exists to coordinate policies and programmes concerned with agroforestry and other organic technologies for soil fertility enhancement.

Extension activities are dominated by the MAI Extension Department, which in the past has been prescriptive and concentrated on the use of inorganic fertiliser on maize. Extension policy now places more emphasis on participatory methods with a more client driven approach, but this has not yet been widely implemented at the field level. Field assistants' involvement in welfare distribution activities as part of their official duties has worked against the adoption of more participatory extension. Projects such as MAFE and PROSCARP have supported extension activities in soil conservation and agroforestry and other organic approaches to soil fertility management (with training, finance and planting materials). Similar approaches have been used by a number of NGOs. These may operate in more limited areas and sometimes lack the capacity to extend and develop their services, indeed some work with and rely on the services of government field extension staff. Their extension services tend to be provided more in the context of community development projects which may also be working with communities to promote income diversification, savings and credit clubs, and education, health and roads services and infrastructure.

Activities promoting access to inorganic fertiliser have focused on extending farmers' access to input finance, either providing credit for their purchase or issuing them as grants. Such activities have tended to be primarily driven by more immediate food security, welfare or income considerations, rather than an explicit long-term focus on improving soil fertility management, although these issues are intimately related.

Progress in terms of on-farm adoption of soil and water conservation has been limited without formal project support, although there is evidence of patches of adoptions, and this is currently being studied. It appears that technologies developed for soil and water conservation and organic soil fertility management have not so far been attractive to farmers. This is due largely to their financial, labour and institutional constraints, although farmers in some areas are showing more interest in 'best bet options' being developed, tested and adapted (such as more maize/pigeon pea mixtures, undersowing of maize with *Tephrosia vogelii*, and use of *Mucuna* as a green manure). Credit activities have been

more successful in terms of farmer uptake (for example MRFC and the USAID supported National Association of Smallholder Farmers), but it is generally recognised that inorganic fertiliser alone does not address problems of deteriorating soil structure, and complementary organic technologies and soil conservation also need to be encouraged. Some fertiliser suppliers are actively involved in initiatives to try to overcome some constraints on farmers' access to fertiliser and to expand the volume of fertiliser sales.

Three recent initiatives merit special mention. The EU funded Agricultural Productivity Investment Programme (APIP) was started in 1997/98 and provides farmers with a standard 0.4 ha hybrid maize seed and fertiliser package on credit administered through private sector input supply companies and ADMARC. The EU underwrites 75% of the credit. Repayment rates of approximately 70% were achieved in 1997/98, and APIP was estimated to contribute to an incremental production of around 100,000 mt of maize, about 7% of total smallholder production. The use of credit to extend input access, however, means that it is generally the less poor smallholders, with larger holdings, who have benefited.

Following the preparation of a report initiated by the Rockefeller Foundation in early 1998, DFID, the EU, and World Bank supported the Malawi Government in the Starter Pack Scheme in the 1998/99 season, with the distribution of a 0.1 ha package of seed and fertiliser to almost all smallholder farmers in the country. The scheme was primarily intended to address welfare and food security problems. The scheme is currently being evaluated, but it is expected to be implemented again in 1999/2000.

The FAO/World Bank Soil Fertility Initiative in Malawi has, after field visits and wide consultation in Malawi in 1998, produced a Concept Paper with a comprehensive review of the soil fertility situation in Malawi and of soil fertility initiatives. The Concept Paper sets out priorities and components for a soil fertility enhancement programme. It stresses the need for integration and co-ordination of technologies (including inorganic and organic technologies with emphasis switching more to the latter over time). It proposes a set of activities for funding under the World Bank Agricultural Services Project (ASP) and the IFAD funded Smallholder Food Security Project (SFSP) to support other ongoing initiatives, such as the Starter Pack Scheme, APIP and the research and extension activities described above. These activities comprise staff training, extension activities (including prioritisation of soil fertility management in field extension work, national campaigns, farmer field schools, and village level participatory approaches), pilot activities, and research into synergies in soil management and into hoe pans. Other recommendations were for institutional change with the integration of activities within a Soil Fertility Enhancement Programme, and appointment of a National Co-ordinator for the Soil Fertility Initiative. By end March 1999 a Soil Fertility Task Force had been set up by the Malawi Government and a draft Soil Fertility Action Plan had been prepared and was being considered for Government approval. An FAO consultant visited the country in February/March to review progress with the SFI, and he initiated research into the existence and distribution of hoe pans. A further visit was made in April.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

Despite the central importance of soil fertility to the national economy and to rural livelihoods, during our discussions it was frequently noted that there is no consistent, overall soil fertility management policy. Reasons for the absence of such a policy include the technical complexity of soil fertility management within farmers' varied farming and livelihood systems, the poverty of many smallholder farmers, the wide range of stakeholders and stakeholder interests involved, and the complexity of interactions between soil fertility and short and long term policy considerations in promoting rural welfare and productivity. It is also difficult to define what is included in soil fertility policy.

A narrower view of soil fertility management policy would include strategic decisions in national research and extension services' focus on land husbandry and on soil and water conservation. A broader view might add soil and crop management and promotion of access to fertilisers through input distribution, subsidies and support of farmers' access to input credit (although these activities might be considered crop production policies). Malawi's experience shows that soil fertility management by farmers also depends upon a much wider range of policies affecting their access to crop output markets, food security and poverty, input/output price ratios, and the ability of private companies to invest in rural markets. These in turn depend upon policy implementation with regard to macroeconomic management (devaluation, interest rates, and inflation), rural infrastructure (roads and telecommunications), safety nets and rural welfare law and order, and rural institutions affecting property rights (for example land tenure). A comprehensive view of soil fertility management policy must allow for this wider range of policy effects. Although soil fertility considerations should not drive policy formulation in these areas, they should be taken into account.

Policy is also often taken to describe strategic decisions by central government and their implementation. Policy formulation, implementation and impact are then affected by the decisions and actions of organisations and individuals within and outside government. Policy formulation, implementation and impact therefore need to take account of decisions being made by stakeholders at different levels: donors, politicians, central government, companies, NGOs, local government, traders, and farmers. This is particularly important with soil fertility management where stakeholders are acting with different objectives in local conditions that are varied and complex.

On the basis of discussions in Malawi, we identified eight key policy making and implementation issues.

1. *Welfare, investment, and sustainability*: The relative importance in soil fertility policy of welfare objectives on the one hand and longer-term investment in sustainable rural livelihoods on the other is often blurred. Low soil fertility has immediate welfare implications, causing low productivity, low incomes and food insecurity. This demands immediate action to improve productivity and access to food, and increasing farmers' access to and use of inorganic fertilisers is often considered to be a cost-effective means of increasing national food security

(although it is still necessary to distinguish between national and household food security). However, such action is often criticised for not being ‘sustainable’ and for failing to invest in soil fertility, as it may involve ‘hand outs’, promote dependency, upset fertiliser/maize price ratios, and inhibit both farmers’ interest in longer term organic technologies and the development of viable markets. There is therefore a critical need to develop approaches that effectively address both welfare and investment objectives in soil fertility and welfare policy and to determine how long it will be before soil fertility and productivity rise enough to allow welfare objectives to recede, with the removal of the subsidies they require.

2. *Inorganic and organic technologies*: Although the complementarity of inorganic and organic technologies is widely recognised, there are differences in their requirements for on-farm adoption (as regards time scale and market conditions for example) and tensions between shorter term welfare considerations (which favour the promotion of inorganic fertilisers) and longer term soil fertility considerations (which may favour relatively more emphasis on organic technologies), as discussed above. Organic technologies based on legumes may suffer increased risks from pests and diseases (although these may be reduced by use of pest and disease resistant indeterminate varieties) and may demand greater management skills and labour.
3. *Produce markets*: Weaknesses in markets (for example poor information flows, poor roads, and low volumes of produce) result in wide seasonal fluctuation in maize prices (with low prices paid at harvest), and weak markets for grain legumes and for other potential alternative crops. For some crops the absence of local processing facilities or lack of utilisation know-how limits farmers’ benefits from growing these crops.
4. *Fertiliser prices*: High fertiliser prices not only make it difficult for many farmers to afford to purchase fertiliser without credit, but they also reduce the financial benefits of inorganic fertiliser application and with high nominal interest rates make borrowing risky. Access to credit for fertiliser is often limited to farmers growing cash crops and to maize farmers with larger holdings.
5. *Input supplies*: Farmers face important constraints in accessing inputs. There are perceived shortages of seed and planting material for improved varieties of grain legumes, green manures and other soil conservation and fertility enhancing species, and systems for production, storage and distribution of seed of improved legume varieties have not been developed on a scale sufficient to meet potential demand. (The Dhal Millers Association is an interesting case where the private sector is developing systems to provide smallholder farmers with pigeon pea seed, in order to promote the crop). In addition to the problems of affordability and profitability of inorganic fertilisers discussed above, their purchase is made more difficult by standard packing in 50kg bags, poor roads, and long distances to fertiliser distributors in trading centres. Local traders do retail fertilisers in much smaller quantities, but there are reports of adulteration. Norsk Hydro is now packing fertiliser in a range of smaller packets, from 2kg up to 20kg.

6. *Research and extension linkages and methods*: Although the success of the maize productivity task force group 1 field trials and the distribution of the starter packs have demonstrated the ability of extension field assistants to undertake demanding tasks in the field, they are hindered by lack of resources, and improved information flows are needed between field staff and research. The variability between farmers in their resources and soil fertility management requirements, and the greater complexity of integrated organic/inorganic soil management practices requires new approaches to extension work such as farmer field schools and participatory extension methods.
7. *Private sector, public sector, NGO and farmer roles*: The (potential) roles of these stakeholders in improving soil fertility need to be identified and supported, and conflicts recognised. It is important, for example, that public agencies do not crowd out or undermine beneficial private sector activity in input and output marketing, for example, but help to promote it while guarding against opportunistic behaviour. Support and regulation have to be finely balanced, and this requires careful design of appropriate systems, building of the necessary human resource capacity, and stable government policy and economic conditions.
8. *Vertical, horizontal and temporal co-ordination*: It is not clear what are the appropriate levels (national or local) for some types of decision making, particularly in the context of the current proposals for decentralisation. Are some pricing decisions, for example, best made centrally or best allowed to vary between different areas? How, and at what level, can and should seed production, prices and demand be co-ordinated? How can consistency and continuity in programme investment and implementation decisions be maintained over longer periods of time in the context of changing donor priorities, varying production conditions and unstable markets?

POLICY PROCESS ISSUES

The 1994 Strategic Action Plan developed by MAI (at that time MoALD) began to reflect increasing concern about soil fertility problems. Over the last five years a consensus has been emerging about the need for urgent attention to soil fertility management. At the same time, as described earlier, research activities have developed 'best bet options' and experience has been gained from pilot projects. The Maize Productivity Task Force has played a key role in raising these issues and in stimulating action. However, broader policy development has lacked longer-term strategies to address both soil fertility and rural welfare issues and has been pulled in different directions by changing and often conflicting donor interests. It has consequently been marked by disjointed interventions driven by short-term welfare considerations.

In 1998 three reviews of soil fertility problems and options were conducted and considered together in a round table meeting in July involving donors, different Government departments and others involved in research. A consensus was agreed on the need to press on with integrated inorganic and organic technological development and to develop a more comprehensive policy and programme co-ordination with the formation of a Soil Fertility Task Force and the possible appointment of a Soil Fertility Enhancement

Programme Co-ordinator. Constraints on the capacity of Malawian government departments to undertake this co-ordination are recognised as a result of the existing heavy demands being made on limited numbers of experienced and qualified staff.

Major changes are being proposed in sectoral and national mechanisms of programme co-ordination and implementation, with the development of the Malawi Agricultural Sector Investment Programme (MASIP) and proposals for decentralisation of government services. While the mechanisms of MASIP and of decentralisation are still being worked out prior to any decision to adopt them, both are compatible in broad terms with the need for improved vertical and horizontal linkages in policy support for improved soil fertility management. It is an opportune time for stakeholders in soil fertility management to inform and influence broader policy decisions on MASIP and decentralisation.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

The preceding sections have identified key issues where policy co-ordination and management need to be developed. The structures and processes by which these gaps might be filled is not, however, clear. Discussion with a range of stakeholders suggests the need for the development of mechanisms and processes to integrate stakeholder representation and decision making. Options for action research to learn more about existing mechanisms and processes that might be appropriate under different circumstances were discussed with a range of stakeholders in Malawi. Two broad options were considered:

Option 1: There is no need for any further co-ordinated action to integrate decision making, as there are more pressing issues which need to be addressed. A more direct development approach is needed with strong central policies on issues such as bulking up of improved grain legume seed, or the design and implementation of more productive and sustainable safety nets. Policy makers, researchers, donors and others should not be distracted from engagement with these more immediate problems.

Option 2: More effective co-ordinated action amongst stakeholders is needed. This might be promoted in different ways described below as stages 1 to 3. While implementation of stages 2 and 3 are dependent on implementation of stage 1, stage 1 might be adopted on its own, or stages 1 and 2 might be adopted without stage 3, or stages 1 and 3 without stage 2.

Option 2, stage 1: This would facilitate the sharing of experience about integrated actions that are supporting improved soil fertility management at community level within Malawi. This sharing could be achieved by commissioning studies to document successful cases and then critically analyse them to identify principles and models for, and stakeholder benefits from, integrated decision making and action. This might build upon current research into the uptake of organic soil fertility enhancing technologies and provide the basis for workshops to stimulate more co-ordinated action.

Option 2, stage 2: Broader lessons could be gained from other African countries' experience with integrated action to support improved soil fertility management at community level. This would involve participation in a regional forum, linking stage 1 above to complementary work in other countries.

Option 2, stage 3: Building on stages 1 and 2 above, an action research approach could then develop and test processes and models in community development projects working in an integrated way over two or three years. This action research would feed lessons back to implementers and policy makers operating at different levels. This option, in particular, requires a commitment from stakeholders in the action research to be willing to work together to try out and invest in new local partnership initiatives. Such an initiative might be organised as a set of elements to make existing or new area based projects more effective in addressing soil fertility constraints to the development of sustainable rural livelihoods.

Reactions to these options

There were considerable differences of opinion between stakeholders consulted as regards the relative merits of these proposals. Some felt strongly that there was already sufficient communication between policy makers, researchers and those working with farmers and that further emphasis on action research to share experiences was unnecessary. They therefore favoured option 1, and stressed the need for priority to be given to co-ordinated action on the issues discussed under option 1 above.

Others felt that there is a need for greater learning and sharing of experience about mechanisms for co-ordination between local actors at community and district level, with feedback of information to more central policy makers. There was a general consensus here that lesson learning within Malawi was of primary importance, and that sharing of experience with other countries was of more limited value.

It was suggested that now is an opportune time for mechanisms to be developed for stakeholders to come together to address these issues. Such mechanisms can build on and be integrated both with existing initiatives (for example the Soil Fertility Task Force of the SFI, National Agroforestry Steering Committee, private/ public sector partnership in APIP, village level action plans and community monitoring and action being developed by ASP and MAFE and a range of NGOs, on farm and farmer managed research conducted by a range of research organisations, the Rockefeller supported Soil Fertility Network and IDEA programme) and with proposals for decentralisation, MASIP, and a national SFEP co-ordinator.

Conclusions

Following the visit and subsequent consultations, we have concluded that within the 'soil fertility community' within Malawi there is currently significant sharing of information on farm level soil fertility management options. This has been promoted by a number of initiatives in the last few years, and is likely to be promoted further by current proposals under the SFI. At the same time, central policy and thinking has been dominated by

differences in approach to the balance between, for example, short term welfare needs of the poor, macro-economic management, and longer term concerns with economic liberalisation and growth. The current initiatives by the FAO, donors and the Malawi Government, to promote improved co-ordination in soil fertility policy will do little to improve co-ordination and consistency in policies affecting soil fertility management unless there is consensus, co-ordination and consistency in the wider policy framework.

In this context there are potential benefits from farm and community level action research that attempts to integrate co-ordination of local level soil fertility initiatives with the implementation of safety net programmes for the rural poor. Such research should inform current debates and policy development about 'productivity enhancing safety nets' and would need to be firmly located within a community development programme or project. Such research would be classified under 'option 2 stage 3' in the schema developed above. The development of proposals for such action research project(s) will require some research into existing experience with integrated action elsewhere (in Malawi and beyond) - as described under 'option 2 stage 1'. However, such research is likely to be of limited value unless directly driven by concrete demand from stakeholders intending to develop and implement a community action research project. Research under option 2 must therefore be led by demand from agencies working in the field with communities and other stakeholders that consider these issues important.

Appendix 1: Persons consulted

1. Dr Ian Hayes, Malawi Agroforestry Extension Project
2. Mr Zwide Jere, Malawi Agroforestry Extension Project
3. Mr Nick Osborne, CARE
4. Mr Zimmer Balduin, Head of Delegation, Delegation of EC in the Republic of Malawi
5. Mr Buddhike Samarasinghe, Agricultural Services Project
6. Mr Francis M'Buka, World Bank Mission in Malawi
7. Professor Spider Mughogho, Bunda College of Agriculture
8. Mr Thomas Carr, Smallholder Agribusiness Project
9. Mr James Dunn, United States Agency for International Development
10. Mr Steven Shumba, United States Agency for International Development
11. Ms A Cristina Amaral, Delegation of EC in the Republic of Malawi
12. Mr Alex Shemu, Norsk Hydro Malawi (Pvt.) Ltd
13. Mr Nyami Jaff Mulenga, Director, Land Resources Conservation Department, Ministry of Agriculture and Irrigation
14. Dr Sigglinda Snapp, ICRISAT
15. Dr Lowole, Chairman, Soil Fertility Task Force, Ministry of Agriculture and Irrigation
16. Jane Wathome (Programme Director) and Charles Changaya (Deputy Programme Director), SCF(UK)
17. Sakou Jobe, (Country Director), Edson Musopole and Felix Mtonda, Action Aid
18. Susan E. Mills, FAO Representative, FAO
19. Mr Chyanza, Director, Department of Extension, Ministry of Agriculture and Irrigation
20. M. Noel Nsanjama, Assistant Director of Agricultural Research and Technical Services
21. Dr Saka, Chitedze Agricultural Research Station.
22. Dr Harry Potter, DFID.
23. Dr Todd Benson, Chitedze Agricultural Research Station.
24. Dr Rob Gilbert, Chitedze Agricultural Research Station.
25. Anne Conroy, Office of the Vice President
26. BK Phatel, Rockefeller Foundation

27. Dr Alex Phiri, Bunda College of Agriculture
28. Dr Davis Ngongola, Bunda College of Agriculture
29. Mr Scott Simons, Planning Department, Ministry of Agriculture and Irrigation
30. Mr Steven Carr
31. Mr Mazombwe, Optichem
32. Mr A G K Thindwa, ADMARC
33. Mr George Manda, MASAF.
34. Mr Jack Phiri, Agricultural Trading Company Ltd

Appendix 2: Key documents

Blackie, M.J., T. Benson, A. Conroy, R. Gilbert, G. Kanyama-Phiri, J. Kumwenda, C. Mann, S. Mughogho and A. Phiri, 1998. *Malawi: Soil Fertility Issues and Options*. Rockefeller Foundation, Lilongwe.

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FAO, 1998. *Malawi Soil Fertility Initiative. Concept Paper*. Investment Centre Division, FAO/World Bank Cooperative Programme. Rome.

SECTION 2
COUNTRY REPORTS

ZAMBIA

2.6 ZAMBIA¹²

Peter Brinn and Alistair Sutherland

DYNAMICS AND CHANGES IN RURAL LIVELIHOODS

Liberalisation

Since 1991 important economic reform policies have been implemented. These are aimed at macro-economic stabilisation, liberalisation of marketing and trade, privatisation of parastatals, improving the efficiency of public service delivery systems and rehabilitation and development of infrastructure with a view to creating an enabling environment for private sector participation. These radical changes in the Zambian economy have led to the transformation of the Zambian economy from being highly regulated, to one that is essentially driven by market forces.

The supply response in the agricultural sector to these reforms is beginning to have an influence, after a slow start. Recent sectoral performance has been characterised by sharp fluctuations in cereal production. Agricultural GDP was negative in 1990, 1992 and 1994, the total area of cultivation has declined by more than 15% from the 1985-90 average. The 1991-94 reduction was due to reduction of subsidies and withdrawal of credit and product and input price subsidies, wide swings in interest rates, non-availability of institutional credit and lack of guaranteed produce markets. The lack of effective decentralised markets and the hesitant emergence of agricultural marketing and processing entrepreneurs also constrained producer supply response.

In the past, most poverty was concentrated in the rural areas. Urban poverty began to emerge during the 1980s, with declining revenue from copper. The removal of government food subsidies in the late 1980s and early 1990s increased hardships for the urban poor and resulted in a return to rural areas by some (mainly retired) people.

Currently over half of the population lives in rural areas and small-scale agriculture is the most important source of rural livelihood in Zambia. Sedentary mixed livestock crop systems, with semi-permanent cultivation are found in the western, central, southern and eastern parts of Zambia. Shifting hoe cultivation prevails in the north of the country, where land is more abundant but conditions for livestock keeping and semi-permanent cultivation are less favourable.

Zambia's rural economy has become increasingly dualistic since economic liberalisation. In areas with good access, the main influence on rural livelihoods has been the process of agricultural liberalisation. In the remoter areas, the application of public sector support measures in the form of "soft" fertiliser and seed loans and targeted food relief have had an influence.

¹² See Appendix 2 for contextual material on Zambia

Currently there is an active but unresolved debate amongst agricultural policy makers of how to maintain and sustain the benefits of liberalisation and further encourage private sector development while supporting the most vulnerable in society. Various options including rural zoning for subsidised inputs are being examined (see later sections).

Trends

In accessible areas agricultural commercialisation has progressed over the past five years, with a significant growth in export oriented production in the larger-scale commercial farming sector and also among medium and small-scale commercial producers, mainly through contract farming and out-grower schemes. These may involve “partnerships” between the private sector and NGOs and which are significantly different from more familiar Government/donor development models, see Box 1.

Box 1

An example of partnership

Between :

- **Small-scale contract farmers.**
- **Cheetah Z Ltd** (a commercial company promoting the export of paprika)
- **Co-operative League of the USA** (a NGO providing support to agricultural co-operatives)
- **Credit Management Services** (a Zambian commercial financial institution providing credit)

Result : 1,000 tons of Paprika exported in 1998

This growth has generated more employment opportunities for both farming households using their own labour, and poorer households labouring for others. Outgrower schemes have provided cash earning opportunities for small-scale farmers on the line of rail and main transportation routes. Some of the schemes also support maize production alongside another primary cash crop; providing fertiliser loans and collecting repayment in the primary cash crop, or failing that, in maize. Maize production has become unattractive for the majority of large and medium scale commercial farmers. In order to try and increase maize production from the small-scale farming sector, the food reserve agency has supplied seed and fertiliser on credit to smallholders. As repayment rates have been rather low, due to some regarding these loans as a free gift from government, this programme has resulted in some distortion of the agricultural credit and fertiliser markets.

In the remoter areas, there has been a move away from maize and other cash crops promoted through publicly funded input and extension programmes, towards more traditional food crops. Some of these traditional crops are also sold in order to raise cash (particularly beans, finger millet, sweet potatoes and dried cassava). The agricultural livelihoods in the remoter areas are less subject to commercial forces and more subject to public programmes, than those along the line of rail. The food reserve and food relief programmes have had an effect. Food reserve programmes have in some cases pandered to farmers demands for fertiliser, even through the cost-effectiveness of fertiliser application to maize in these cases is questionable, and there is a poor record of repayment, and in some cases pressure from politicians to continue giving credit to defaulting farmers. Food

relief has had more effect in the drought prone areas. While of obvious short-term benefit, the negative impact of food relief has been mainly in terms of undercutting local food security oriented development programmes (this influence has been minimised in cases where the same agency has been responsible for co-ordinating both the development and the relief programmes).

Adjustments in rural livelihood strategies have included changes in agricultural production, storage, marketing and food processing and consumption behaviour. Crop diversification away from maize has been a national trend, although maize remains the preferred staple food crop in most areas, with surplus production being marketed or stored. Other basic food crops (cassava, sweet potato, beans, groundnuts) have also become cash crops for households without easy access to external inputs. Small-scale vegetable production (often done by young men) has also increased in importance, particularly for households with access to *dambo* and stream-side gardens who sell surplus locally. In some areas farmers have started storing their crops, including maize, for longer periods, in the hope of benefiting from price increases. However, it has been difficult for them to market these crops where the roads are not good. Increased production of small-grains in the drier areas has resulted in increased brewing of local beer. Where food has been in short supply, there is evidence of households reducing intake and in the north of Zambia there is evidence of increased stunting among children, mainly a result of limited high value (energy and protein) foods.

Sources of off-farm income are diverse, ranging from piecework, petty trading and beer brewing to charcoal making, handicrafts, timber, gathering, honey collection, brick-making, construction and local mining (for building materials and precious stones). Most of these sources of income appear to be increasingly important, particularly for younger people without access to agricultural credit and subordinate family labour. It is not clear to what extent income from these activities is being used to finance agriculture and land improvement, rather than immediate consumption and survival needs.

With regard to inorganic soil fertility management, there are two notable trends. Along the line of rail, farmers engaged in more commercialised agriculture have more incentives to use purchased inputs, including fertiliser, in order to boost production and increase returns on other inputs (labour, seed and pesticides etc.). To improve their returns to fertiliser however, they need proper soil analysis, and these services are not easy to come by locally. The range of commercial fertiliser products available is increasing, but a convenient and easy mechanism for identifying which products to buy is not yet available for small-scale out growers.

In the remoter areas, and also in many of the traditional maize growing areas in Eastern, Southern and Central Provinces (including Kaoma in Western Province), there is increased interest from farmers in organic methods for increasing soil fertility. At the same time farmers in these areas continue to cry out for fertiliser, particularly for it to be delivered on time. In these areas most farmers have made a general shift away from maize as the only staple crop towards a range of less fertiliser dependent staples including cassava, sweet

potatoes and sorghum. In the north of Zambia, there has been an increase in *chitemene* (slash and burn) cultivation.

SOIL FERTILITY MANAGEMENT INTERVENTIONS

Soil conservation using physical and organic methods was emphasised up to the late 1950s, but with the advent and widespread uptake and impact on productivity of inorganic fertilisers and high-yielding maize varieties this emphasis was dropped during the 1960s, 70s and 80s. Only in more recent years have programmes emerged promoting organic technologies which can contribute to improved land management including:-

- legume enriched fallows (ICRAF)
- crop rotations involving N-fixing legumes (MAFF Crops and Soil Research);
- soil conservation and related land husbandry (SCAFE);
- minimum tillage and conservation farming (ZNFU-CFU) and
- lime application (SPFS)
- PAM
- Various NGOs
- Swedish co-operative centre
- GART.

These programmes remain location-specific and their technical content in some cases reflects the relatively narrow mandate of the sponsoring institutions, more than it responds to the broader needs expressed by farmers.

There is a considerable body of Zambian soil research that has focused on four broad areas. Firstly, problems of soil acidity in northern Zambia have been the topic of long standing basic and applied research. To date the main applications of this research in terms of improved management practices are the application of agricultural lime and a research policy that plant breeders should focus on the developing acid tolerant varieties for these areas. However, agricultural lime has not been accessible to smallholders, and its transport costs are very high.

A second line of research has been on inorganic fertilisers. Applied research on fertiliser formulations, rates and fertiliser management for maize and some other crops, both on-station and on-farm, has resulted in relevant location specific fertiliser recommendations for most farming systems in Zambia. There have been investigations into using local phosphate sources, and methods for processing local rock phosphates have been developed, but not taken up on a commercial scale.

Thirdly, since independence, the government has invested significantly in soil characterisation and mapping, particularly through the training of soil surveyors. At the applied level, this has mostly been used for mapping and farm management planning, including irrigated land management, on larger-scale commercial enterprises. It has also

been used to characterise constraints, such as chemical deficiencies or imbalances, low levels of organic matter, and hardpans.

Finally, there has been a smaller body of research into organic soil management methods, including agro-forestry. This started with green manuring trials in the 1950s but interest died out with the spread of inorganic fertilisers in the 1960s. Interest was revived in the early 1990s, through agro-forestry and related improved fallow trials that offered promise for farmers unable to get access to inorganic fertiliser. Last season Zambia hosted some trials as part of the Rockefeller/CIMMYT soil fertility network in which a range of organic manure options have been tested out under a range of on-farm conditions, with the objective of allowing farmers to choose the most appropriate options for themselves.

SFI Zambia Programme

A FAO/WB mission visit to Zambia in June 1998 marked the start of Zambian SFI activities. To date a National Core Team has been formed and an Action Plan for 1999 prepared. Funding for start-up activities has been identified and released from ASIP sources. The Zambian SFI programme aims to:

- Expand the technical and geographical breadth of existing SFI related programmes and projects;
- Build institutional capacity;
- Adjust the policy, legal and regulatory environment to provide greater encouragement to farmers to adopt sustainable land use systems and safeguard them from unscrupulous traders;
- Identify through participatory methods three areas where farmers could test and adapt means of improving soil productivity;
- Train Government and NGO staff in promoting sustainable land management using farmer field schools;
- Expand lime demonstrations among small-scale farmers;
- Commission a study on commercial lime production and marketing;
- Study N-fixing legumes suitable for high rainfall areas;
- Complete a national soil degradation assessment, and
- Promote the use of suitable tillage practices.

The wide scope of these aims reflects, to some extent, individual and institutional interests and with the exception of the proposed policy study mainly seeks to reinforce and extend the activities of existing programmes.

Within the Land Husbandry Section of MAFF where the SFI Secretariat is housed, the problems of multi-donor funding, to which the SFI will contribute were evident. Donor supported programmes include SIDA (SCAFE); UNDP – SFSDP; IFAD – SIWUP (Smallholder Irrigation and Water Use Programme) and the WB – SFI. These different funding agencies with different procedures (financial, reporting, monitoring) are essentially funding small components of overlapping programmes. This inevitably consumes a considerable amount of administrative resources when compared with

implementation effort. In this area ASIP progress on donor co-ordination is not very evident.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

Policy debate on agriculture has been a prominent part of the ASIP process, and continues. With regard to soil fertility management and related issues, policy areas identified during the visit include:

- targeting inorganic fertiliser and credit within the small-scale sector;
- support for the commercial development of local mineral fertilisers (limestone and rock phosphates);
- funding for public and private sector research on soil fertility management;
- extension approaches to SFM in the context of increasingly commercialised extension services;
- availability of technical information on SFM and limitations to its uptake;
- contract farming and its implications soil fertility management;
- the role of farmer groups and local authorities in natural resource management;
- scope for increased dialogue between public and private sector actors influencing farmers' soil fertility management.

Elaboration of one of these policy areas: inorganic fertiliser

From the mid 1960s, fertiliser was targeted to all eligible small-holder farmers based on their willingness to receive inputs (fertiliser and seed) on credit and sell produce back to the supplier of the inputs (eligibility in practice was often in terms of gender, farming record and local political connections). This programme was implemented over a period of more than twenty years with reasonable success in terms of production and repayment (the main defaulters were larger farmer/politicians).

The main problems were inefficiencies in fertiliser delivery and supply of the wrong type, and late payments. Fertiliser was a subsidised input to all farmers, whether small holder or large-scale commercial. In the early 1990s, the removal of fertiliser subsidies together with reduced smallholder credit, made it much more difficult for small holders to access fertiliser and maize production slumped.

The government adopted supportive measures to boost national maize production, and currently the Food Reserve Agency provides small holder farmers with fertiliser loans, mainly through commercial fertiliser supply companies that tender for contracts from government. Default rates are quite high and apparently some of the fertiliser is sold on at lower prices by borrowers who do not intend to pay back loans and feel immune from any follow-up action. There is debate about the value of this approach, as it is seen to effectively undermine the openness of the fertiliser market and perhaps more importantly the institutional basis for agricultural credit.

The supply of fertiliser particularly to remoter areas is seen to be subject to political influence, rather than market forces. There is talk of more focused targeting of organic options to the remoter areas in which the economics of fertiliser are more questionable. This debate seems to involve the political decision-makers on the one hand and the agricultural experts on the other.

POLICY PROCESS ISSUES

Reconciling liberalisation with public sector smallholder support is a key thread of soil fertility related policy processes

A key question is how to address the complex dynamics of small-scale farmers within the government policy of liberalisation whilst promoting private sector growth to improve food security and increase incomes of these farmers. A recent comprehensive analysis¹³ concludes that a dual system be employed. Areas with minimum “hindrance” should be left to the private sector to develop. A special targeted programme for smallholders in isolated areas is necessary to boost the capital base, food security and incomes of small-scale farmers. Such a scheme involves subsidised bartering weaned over a 3-year period through adjusting the fertiliser/maize exchange rate.

Areas with hindrances require targeted support in the interim to assist farmers to adjust to liberalisation, whilst concurrent efforts are made to minimise hindrance factors through a programme of infrastructure development. Donors have expressed interest in meeting part of the implementation cost, and the private sector has indicated its capacity to satisfy effective demand, on condition that the Government is not involved. For the public and private sector to collaborate effectively in implementing the proposed mechanisms, government is required issue a clear statement on the roles and responsibilities of Government, the Food Reserve Agency, Co-operatives, NGOs and the private sector.

Agriculture and the environment have been given a significant profile in national policy statements since copper prices started to fall in the 1970s. However, up to 1990 government, with the exception of support to maize production and collection did not actively support the policy. More recent measures to encourage export-oriented agricultural enterprises have been fairly successful. Key players in the public sector are the Ministry of Agriculture Food and Fisheries and also the Ministry of Energy and Natural Resources. On the donors’ side the Norwegians (NORAD) fund soils research, survey and extension, the Dutch fund soils and livestock research, the Swedes (SIDA) fund soil conservation, the Belgians support soils research and surveys, the Germans (GTZ) fund extension and integrated development while these and UNDP and the World Bank have all supported agriculture.

The World Bank and FAO have taken a lead on the ASIP process, which is currently stalled. Various NGOs have operated in agriculture, but there is limited evidence of strong engagement on policy issues. Instead, each NGO has been given relative freedom to

¹³ ASIP Consultative Forum, 1999. Proposed Marketing Mechanism for Fertilizer for the 1999/2000 Season.

implement development programmes, and also public sector relief programmes such as drought relief on behalf of government. Smallholder farmers have some opportunity to voice opinions through representation on district agricultural committees and their representatives on the National Farmers Union. However, there are no really strong farmer organisations in which small holders are the dominant constituency. The private sector/NGO informal partnerships are a significant influence on the ground, but appear to have rather limited dialogue with government.

Decentralisation has been on the agenda as part of ASIP for some time, but there has been rather slow progress in devolving decision-making and funding to district level. There has been some progress recently, through increased devolution of resources in some programmes (such as SCAFE) to district level, and through development funds administered through District Committees, which have to put up proposals for funding from communities. These committees have been effective in cases where there has been active leadership, in some cases by commercial farmers on the committees.

POTENTIAL POLICY DEVELOPMENT ACTIVITIES

Possible policy areas for further exploration/‘policy space’.

Most of the areas listed in the first paragraph of the section ‘soil fertility management policy issues’ above could be further explored with a view to addressing issues arising from market failure, liberalisation and the contracting capacity of government services.

Potential capacity for facilitating a participatory policy process.

Participatory concepts are familiar in Zambia, both within Government and in the more accessible rural areas. Examples of rural populations obtaining direct benefits from the participatory process are more difficult to find. Among middle-ranking Government staff there is a tension between the policy of promoting participatory approaches and natural reluctance to relinquish authority.

There is capacity within the MAFF, and in the research institutions, for policy analysis and commentary. The ASIP Consultative Forum provides a means of raising issues for discussion at national policy level and involves a range of stakeholders. This Forum is active, respected and benefits from direct access at Ministerial level by publishing *Advisory Notes* on key issues. The Agribusiness Forum also represents a wide range of commercial interests including contract farming. The capacity of these fora to bringing various stakeholders around the table in fully participatory policy process requires further investigation.

At district level the District Agricultural Committees provide a potential forum at which the implications and implementation of policies can be discussed. Traditional authorities have a potential role also, although not all of these have very transparent decision making processes.

Potential study areas

Three potential study sites within Zambia have been identified for the SFI. These are based on agroecological zones; Kasama for zone III; Chipata for zone II and Gwembe for zone I. If key areas of policy related research were agreed, it would probably be possible for a shadow policy group to work alongside the existing teams in two of these areas.

Next steps

The preceding sections have identified key areas where policy co-ordination needs to be further developed. The SFI, in conjunction with the ASIP and Agribusiness fora are existing structures within which to conduct and field the findings of policy research relating to soil fertility. There are several options in terms of taking things forward.

Option 1: To assume that at present there is no need for further co-ordinated action to integrate decision making on soil fertility policy and practise, as there are more pressing development issues which need to be addressed.

Option 2: To form a small policy group within the SFI that would shadow and draw out the policy issues from ongoing and planned SFI activities. These issues could be taken further, either in terms of action research or as discussion areas to be tabled at an appropriate policy forum.

Option 3: To conduct a more intensive policy study on one or more of the areas identified in Section 2.2. Any topics studied would be agreed as high priority by the SFI team and other relevant stakeholders. Such a study might address issues that are common to more than one country, thus giving an opportunity for wider sharing of experiences and issues.

Abbreviations

ICRAF	International Centre for Research in Agroforestry
MAFF	Ministry of Agriculture, Food and Fisheries, Crops and Soil Research
SCAFE	Soil Conservation and Agroforestry Extension Project
ZNFU-CFU	Zambia National Farmers Union- Conservation Farming Unit
SPFS	Special Programme on Food Security
FSA	Food Security Agency
PAM	Programme Against Malnutrition
GART	Golden Valley Agricultural Trust
ASIP	Agricultural Sector Investment Programme

Appendix 1: People Met

1. Herbert Mwanza – Soil Fertility Initiative – National Core Team Sec.
2. Biston Mbewe – Land Use Planning Officer – Lusaka Province.
3. JJ Shawa – MAFF Economics and Market Development Dept.
4. Gert van Heerden – Managing Director Africa and Exports – Tiger Animal Feeds.
5. Adrien Bushman – Omnia Fertilisers.
6. Peter J. Aagaard – Conservation Farming Unit Co-ordinator.
7. A Chalabesa – Chief Agricultural Research Officer – Soils and Crop Branch.
8. Dr Alfred Mapiki – Soil Fertility Initiative Co-ordinator.
9. Anthony Mwanaumo – Co-ordinator ASIP Consultative Forum.
10. Dave Clements – Lonro Cotton Small Holder Manager, Lusaka.
11. Dr Albert Chipeleme, Head, Soil Science Dept, University of Zambia.
12. Prof. V. Chinene, Acting Director, Inst. of Economic and Social Research, UNZA
13. Alex Mwanakasale Agricultural Operations Officer, World Bank, Zambia.
14. Charles Chileya, National Programme Officer, FAO.
15. Jacob Kampen, Lead Specialist Agriculture (Research), World Bank, Washington.
16. Marc Bragge, Outgrower Scheme Manager, Cheeta Zambia Ltd.
17. Brother Paul, Training Co-ordinataor, Kasisi Agricultural Mission.
18. Dr. Chilumbu, Development Advisor, Swedish Co-operative Centre.
19. Mike Murray, 1st Sec Development, BHC, Lusaka.
20. Dave Sorocko, Agricultural Advisor, USAID, Lusaka.
21. Kevin Kabunda, Business Advisor, CLUSA.
22. Jessica Farmer, Advisor, CLUSA.
23. Dr Richard M. Kamuna, Chief Agricultural Officer (Crops), Deot. Of Field Services, MAFF
24. Leighton J. Mwale, Director, Dept of Field Services, MAFF
25. Mark Vander Vort, Assistant Country Director, CARE International, Zambia
26. Dr Kalaluka Munyinda, Dept of Crop Science, University of Zambia
27. Dr Benson K. Chisala, Dept of Crop Science, University of Zambia
28. Charles Chabala, Country Representative, Swedish Cooperative Centre Field Office, Lusaka
29. Dr Chosana A Njobvu, Research Fellow, Institute of Economic and Social Research, University of Zambia,
30. Dr Dierk, Hesselbach, Agricultural Advisor, ASSP- GTZ, Mazabuka

Appendix 2: Country description

- Zambia, with an estimated population of 10 million inhabitants and an area of over 750,000 km², is amongst the least densely populated countries of southern and eastern Africa.
- The country can be divided into three main agroecological regions. Region I, in the south has a mean annual rainfall (MAR) of less than 800 mm; Region II, occupying a band across the centre of the country has a MAR between 800-1000mm; Region III in the north and north-west has a MAR between 1000-1400mm. Most rainfall occurs between November and April.
- Zambian soil properties reflect both the parent materials and the agroecological conditions. Strongly leached, acidic soils dominate the wetter north and north-western areas. These soils together with the sandy soils developed on the Kalahari sands of the west constitute the least fertile soils in Zambia. Less weathered soils are found on the drier plateau of Eastern, Central and Southern Provinces. Soils formed over basic and intermediate rocks in these drier areas are chemically more fertile with good physical properties and, where they are not limited by gravel layers, steep slopes or imperfect drainage they constitute good agricultural soils. Soils over acidic Basement Complex rocks have a lower agricultural potential. Heavy black clays, mainly poorly drained and in places affected by salt and alkali, occur in the Kafue flats, in the Luangwa valley and the upper Zambezi floodplains.
- In generalised terms the agricultural potential of Region III is mainly limited by low chemical fertility and acidity; the main constraints of Region II are physical and associated with a decline in the organic matter content through cultivation, although this region also contains Zambia's most productive soils. In Region I moisture availability is generally a more limiting constraint to agricultural production than soil fertility.
- There are frequent references to "most Zambian soils being sandy, acid, low in nutrients and prone to hard pan formation". This rather negative description should be countered with the occurrence of extensive exceptions and the relatively low intensity of use, which make Zambia's soil resources the envy of the region.
- Estimates of the potentially arable area vary between 18 million and 56 million ha depending on the definition, but only around 1.5 million ha are cultivated in any one year and possibly 9 million ha have at one time been cultivated. Because most of the rural population is settled where there is reasonable access to basic services (well water, primary schools, feeder roads and clinics), soils in these areas have mostly been cultivated over a long period, and fertility has declined overall.

- Some 650-750,000 small farmers produce the bulk of agricultural production, largely under rain-fed conditions, and in Region III, often using shifting cultivation practices. Many smallholder farmers produce for subsistence and also aim to sell any surplus, while others are more commercially oriented. The recent development of contract farming, in which up to 200,000 farmers are estimated to be involved, reflects the potential for further expansion of cash oriented small-holder production. The area cultivated by smallholders typically ranges from 1-5ha, depending on family size and whether the farm has draught animals. Around 250 large-scale commercial farmers play a dominant role in the production of marketed crops, and there is a growing category of medium-scale “emergent” farmers, many of whom are investing earnings from other sectors in commercially managed farms. An estimated 50,000 ha mainly on commercial and emergent farms is irrigated.
- Maize is the predominant and favoured staple food crop, with cassava in the wetter areas and sorghum and millets in the dryer.
- The past dominance of maize together with associated subsidies and a guaranteed market has changed dramatically with the adoption of a “liberalised” agricultural policy since the early 1990s. The important implications of this are examined in more detail in the following sections.

SECTION 2
COUNTRY REPORTS

ZIMBABWE

2.7 ZIMBABWE

Ian Scoones and James Keeley

A number of different individuals and groups were consulted during the May 17-27th visit (see Appendix 1) and a number of key documents were identified (see Appendix 2). This consultation built on previous contacts made under collaborative research activities which IDS has involvement with in Zimbabwe. These included: the dynamics of soil fertility (EU funded; partner FSRU/DRSS); Crop-livestock integration (DFID funded; partner IES, UZ); NUTNET (NEDA funded; partner IES, UZ); and Indigenous Soil and Water Conservation (NEDA funded; partners IES, UZ and ITDG-Zimbabwe).

DYNAMICS AND CHANGE IN RURAL LIVELIHOODS

Rural livelihoods in Zimbabwe have to be understood in historical context. The dispossession of large areas of the most productive land by white settlers during the colonial period has resulted in a highly skewed land distribution with most small scale communal area farmers living in drier more marginal areas of the country (so-called Regions IV and V). Population densities in these areas are relatively high and land is scarce. Agriculture and livestock production are therefore only part of a wider portfolio of activities, with remittances from circular migration to urban, mine or commercial farm employment making up a significant proportion of most household's income since the 1930s.

Following independence in 1980 efforts were made to boost agricultural production and encourage development in the communal areas. Important progress was made in the fields of education and health provision, as well as rural infrastructure provision. Some attempts were also made at resettlement. In the first years following independence there was significant growth in the small holder agriculture sector with maize from farmers - now with access to inputs and subsidised credit - entering the market. However this boom was relatively short lived and, in any case, was limited to relatively well off farmers in the small number of communal areas in the higher potential areas. The droughts of the mid-1980s had a major impact on the viability of agricultural production due to the mass death of livestock. In addition the slow pace of resettlement ensured that the basic problems of land shortage remained.

During the 1990s livelihoods for many in the communal areas have become even more constrained due to a combination of drought and economic reform measures. The impact of structural adjustment implemented from 1991 had mixed effects. While agricultural liberalisation increased producer prices in real terms, the cost of inputs also increased (although the ratio between input and output prices has remained fairly static). The withdrawal of state supported credit systems from the mid-1980s due to massive default rates was not replaced by the emergence of alternative financial markets in the rural areas. The increases in consumer prices due to adjustment had a major impact on many whom, in most years, are in food deficit and must purchase grain or meal. Declines in real wages

and large-scale retrenchment in many sectors also had an impact on rural economies with reduced flows of remittances making food purchases and agricultural investment increasingly difficult. Rising unemployment in the formal sector also resulted in an increasing number of younger men becoming reliant on rurally based livelihoods rather than non-farm employment. The devastating drought of 1991-1992 further undermined the sustainability of rural livelihoods for many, with the wiping out of important capital assets following the death of a large proportion of the communal area cattle herd.

These factors have combined to result in an increasing level of rural poverty and vulnerability in Zimbabwe in the late 1990s. This has had a number of consequences. In areas where off-farm activities are feasible, many have diversified their livelihoods and the recent period has seen a large growth in craft based activities and petty trading. In the higher potential areas, and particularly where access to wetlands (dambos) is possible, there has been a large growth in horticulture and a decline in investment in dryland agriculture. This has been particularly the case in communal areas around the larger urban centres, particularly Harare, where good transport links and ready markets make vegetable gardening often highly lucrative. In other areas there has been a growth in specialised cash cropping where input and marketing support is provided. The growth in cotton farming in the Zambezi valley is a good example of this. In other areas contract farming of particular crops such as paprika has taken off with the support of commercial companies.

Despite these brighter spots, the overall situation, however, is gloomy. In large part this is because the fundamental issue of land reform has not been tackled. A mixture of political obfuscation, technical confusion and lack of resources from government and donors has delayed any substantial land reform initiative for nearly two decades. At the national level the reliance on the commercial sector for food production and export earnings has meant that the communal areas continue to be seen largely as labour reserves where subsistence production is the norm. In the last months new initiatives on land reform have been started which open possibilities for addressing the fundamental agrarian question of land in earnest (see below). However, without a wider vision for the future of the communal areas these too may founder in the longer term.

SOIL FERTILITY MANAGEMENT INTERVENTIONS

For the communal areas there has long been a recognition that the maintenance of soil fertility is key to the future of small-scale agriculture. The poor granite derived sandy soils of most communal areas produce little without inputs. Extension support since the 1920s has focussed on the encouragement of a mixed farming approach with cereal-legume rotations being combined with periodic inputs of manure and other fertilisers. A strong commitment to the prevention of soil erosion through the construction of contour bunds and the protection of waterways is also a recurrent theme. From the 1940s this was backed by strong environmental legislation and during the colonial era the building of soil erosion measures was compulsory.

A fairly regimented, top-down style of extension has characterised the Zimbabwe extension system for much of the time since the 1930s. Standard recommendations, strict legislation and rigid land use plans have been at the core of the approach. This, not surprisingly, caused much resentment and, during the liberation war of the 1970s, opposition to forced soil management measures became a focus for rural opposition. Despite this, much of the post-Independence approach has remained broadly similar, with much the same recommendations, legislation and planning approaches applying to this day. A key feature of the extension system has been the Master Farmer approach, where model farmers are trained and certificated according to a fixed standard. This includes a range of soil fertility management techniques, including soil erosion protection measures, and manure and fertiliser addition according to recommended rates.

The approach adopted by extension has been backed by extensive research in Zimbabwe on soil management. The earliest rotation and soil amendment trials were started as early as 1913, and a vast amount of research has been carried out since. In the early period this concentrated on measures to reduce the yield decline of continuously cropped maize in the newly established white settler farms. This included a range of recommendations for rotation, green manuring, composting and so on. From the 1950s, however, the emphasis switched to inorganic fertiliser applications and a huge range of fertiliser response experiments on different crops in different agroecological zones were carried out. More recently a renewed interest in a more integrated approach with an emphasis on organic matter management, agroforestry and the mixing of organic and inorganic inputs can be discerned. The work at DRSS and UZ supported by the Tropical Soil Biology and Fertility (TSBF) programme, ICRAF and SoilFertNet have been important in this regard.

Over much of the period since colonisation (and including after Independence, despite rhetoric to the contrary), the emphasis of research and extension work has been on the transformation of communal area agriculture into a model based on the European commercial sector. As one commentator we met during our recent visit put it: “the assumption has been that communal area farmers are simply small big farmers”. A deeper understanding of the dynamics of rural livelihoods and the role of agriculture and soil management in this context has been lacking. Since the 1980s, however, a range of work (at UZ and FSRU at DRSS for example) has begun to explore the dynamics of communal area farming systems in more detail. This has led to a growing understanding of the constraints and opportunities in the communal area sector.

The recognition that a top-down, technically driven research and extension agenda based on inappropriate models of small scale agriculture will not provide the gains expected has slowly begun to dawn. In recent years, prompted by a range of experiments and pilot activities (often by NGOs, but also within government departments), there has been a growing recognition of the importance of a more participatory approach to technology development and extension. Today major changes are underway in the main extension agency, Agritex, with new approaches to participatory agricultural extension being tested. In parallel, a greater emphasis on community based approaches to natural resource management is evident. The success in some areas of the CAMPFIRE programme (focussed on wildlife management) has led to a range of co-management initiatives for

forests, catchments and other resources, including water (under new arrangements specified under the revised Water Act).

Whether this shift in approach will result in the improvement of rural livelihoods remains to be seen. Clearly, as discussed above, broader structural issues surrounding land access have to be addressed in tandem, alongside on-going support to infrastructure development, off-farm employment creation and livelihood diversification. In terms of soils management some fundamental constraints remain. With low inherent fertility, inputs are essential if yields are to be boosted (and even maintained). In many areas inorganic fertilisers remain unaffordable for the majority, and the sources of organic materials are too limited to have the necessary effect. Increasing the availability and efficient use of fertility inputs will therefore remain a high policy priority for the communal areas.

SOIL FERTILITY MANAGEMENT POLICY ISSUES

As will be evident, a whole host of policy issues relate soils management to rural livelihood sustainability, cutting across the broad areas of rural development and environmental policy. In order to achieve some focus, below we highlight three key areas that offer potential for lesson learning and policy dialogue. Each of these of course is linked to other areas, including environmental policy, rural infrastructure policy, irrigation and water policy, decentralisation and rural district council capacity building, among many others.

Land reform and resettlement. Following an initial programme of resettlement after Independence, the pace of reform slowed dramatically through the 1980s and into the 1990s. A number of factors contributed to this, including constitutional constraints (until 1990), political indifference, technical difficulties, resource limitations, and donor unease about compulsory acquisition. Through this period the programme focussed on a set of standard resettlement models, with the most common being the so-called Model A type based on a planned mixed farm with crop and livestock sub-components. Issues of environmental management have been raised in the evaluation of resettlement schemes, and the wider soil fertility and productivity issue has been a recurrent issue. In many cases limited access to cattle for manure or fertiliser has meant that production potentials have not been met. Following a long hiatus, there appears now to be the potential for a break through in the land reform programme. Recently an inception phase has been approved with a range of donors supporting the government initiative to expand the resettlement programme. While a number of big questions remain there appears to be an increased willingness on the part of the government to contemplate a wider range of resettlement options than previously countenanced. This offers opportunities to test out resource management options in the context of supporting the livelihoods of new settlers in a sustainable manner.

Input supply and marketing in a liberalised setting. Following the liberalisation of the economy in 1991, subsidies for input supply and agricultural product marketing have been withdrawn. Although input:output price ratios have not changed fundamentally, many farmers now use fertiliser only in limited quantities and, in the drier zones, many do not use such inputs at all. Combined with the lack of widely available cheap credit this has limited the expansion of fertiliser use, even in the higher potential areas. The blanket recommendations for fertiliser application offered by the extension service are widely ignored and a variety of approaches which increase fertiliser use efficiency while reducing doses are adopted by farmers. The lack of research in this area remains, as noted above, a serious gap. Market liberalisation has raised a number of key institutional issues surrounding input supply and marketing that represent important policy areas for soil fertility management. The key challenge of getting cheap fertiliser to poorer farmers in remoter areas requires study of a variety of institutional issues, including the transaction costs and efficiencies of market supply chains. Currently there are a number of themes that require further work. These centre on:

- Flexible credit provision for fertiliser and other input purchase
- Support for transport and retail marketing in rural areas
- Provision of packs in small enough quantities to encourage demand
- Training of fertiliser suppliers in technical issues of fertiliser use
- Revision of extension recommendations to reflect diverse ecological and socio-economic circumstances

A number of initiatives in different parts of the country have begun experimenting with different approaches (e.g. CARE/ZFU programme in Masvingo; Windmill/CotCo in Gokwe; UZ-Soil Science Department work with soya beans in Mashonaland) which link private sector supply with farmers, either as individuals or in groups. The lessons from these experiences (and no doubt others) could offer useful insights for future policy development in this area.

The broader impacts of subsidy removal have not been fully explored. For example, the type of disincentive effects this has had on particular farmers in particular areas has not been examined, nor the net effect on agricultural production and rural livelihoods. While the reintroduction of a general subsidy for inputs is not on the agenda, an exploration of targeted subsidy options for encouraging fertiliser use in certain areas would be worthwhile. A public good argument for this support could be made in the context of the high opportunity costs of low levels of agricultural production in terms of alternative social safety net provision (notably food aid).

Research agenda setting for soils management and research-extension linkages. As already noted, a huge amount of research has been carried out on soil fertility management in Zimbabwe, both on technical issues and now, increasingly, on broader socio-economic contexts. However, much of this has been somewhat disparate, and the technical research agenda has largely not been set in relation to specific farmer needs and priorities. The result has been a fairly limited uptake by farmers of research derived technologies. There is a widely recognised need for a more effective research agenda setting approach in

agriculture (the recent Agricultural Research Council initiative is an important advance in this respect). However, a more focussed attempt to define priorities in the area of soil fertility management and links to sustainable livelihoods is warranted.

The shift of emphasis in some areas towards a more participatory approach is to be welcomed in this regard. Recently the previously largely researcher driven SoilFertNet work has embraced a more participatory agenda. Clearly solid technical research remains important, but the lessons learned from the past decades emphasise that, if this is not focussed towards farmers' priorities, the chances of adoption and spread remain limited. Links with extension (and other field level activities, such as in the context of NGO projects) are a critical link. Despite the formal requirements for such linkages in the R and E system, these remain weak. Previous attempts to encourage dialogue (e.g. the COFRE (Committee on On-Farm Research and Extension) initiative) have foundered due to a variety of institutional problems. Under new organisational reform initiatives (funded by the Agricultural Support and Management Project (ASMP) in the research and extension services, potentials exist for firmer linkages between research and field level action. Unfortunately, funds for on-farm research in the government research service have declined to effectively zero (outside donor funded projects), making this link difficult to realise in practice.

However, options for more cost-effective participatory research run by farmers linked to focussed technical research inputs and participatory extension have been tested in different areas (e.g. work by FSRU, Contill and others in Masvingo), and could provide a model for future work in this area. Institutional questions of social mobilisation and empowerment of farmers are raised by this work as an important agenda for future action research. With the growing range of private sector actors involved in technology research and delivery, new mechanisms for interactions with stakeholders beyond the conventional government research and extension services will be an important challenge, particularly in the context of increasingly important contract farming arrangements. Learning from such experiences and linking this explicitly to reform processes underway could offer real opportunities for a more effective soil fertility research and extension agenda in Zimbabwe.

POLICY PROCESS ISSUES

A wide range of stakeholders have an influence - or at least interest in - soils management policy questions. However, soil fertility management – and natural resource management more generally – while recognised as important, is not seen as a high priority national policy issue. Various branches of government, notably the extension and research departments of the Ministry of Agriculture and the Department of Natural Resources in the Ministry of Mines, Environment and Tourism are key. With decentralisation, increasingly local government and associated district based line ministries at the Rural District Council level are also significant. Outside government a wide range of local and international NGOs are involved in resource management activities in all parts of the country. Mostly these are project based implementation activities, but some NGOs are also involved in research, networking and advocacy. A wide range of relevant research is carried out under