

National strategies for integrated soil fertility management in Africa

The World Bank estimates that a 4% growth in agriculture is a precondition for rural development in Africa given it has a population growth of 3%. The International Institute for Soil Fertility Management (IFDC-Africa) believes that market-oriented agriculture and agricultural intensification based on the use of external inputs such as chemical fertilisers, improved varieties, integrated pest management, etc., is the only way to achieve development. However, in many regions in Africa the profitability of development packages based on external inputs is too low to attract farmers. Reasons include: the low efficiency of chemical fertilisers because of poor soils and unfavourable climates. Fertilisers and other external inputs are relatively expensive (eg., in 1997 the farm-gate cost of urea was US\$ 350 in Burkina Faso compared to US\$ 100 in India). Marketing of agricultural products is costly and difficult because local transport systems are poorly developed and the domestic market for agricultural products is of relatively small size. In addition, there is neither the buying power nor the capacity to develop a larger consumer market by creating jobs outside agriculture. Beside others, these factors contribute considerably to the stagnation of agricultural development in Africa.

Integrated soil fertility management

In nearly all African countries agricultural production is based on nutrient depletion, shows a negative nutrient balance, and is therefore unsustainable. In order for the yield-enhancing technologies to be applied in a profitable way, improvement of soil fertility management is necessary. Re-capitalising the soil by applying chemical fertiliser is not enough to improve soil fertility management. The efficiency of chemical fertilisers and their economy have to improve as well. This is possible by integrated use of soil amendments and chemical fertilisers. Different amendments exist, and their requirement depends on the need for improved soil organic matter status, improved P availability and/or improved pH. Lime and gypsum are the products most frequently used to improve pH; soluble sources of P and rock phosphate can be used to increase the availabil-

ity of P. The more difficult challenge is to improve the status of organic matter in the soil. More and better organic manure is needed. However, it is difficult to get organic matter when inappropriate agricultural practices cause soil degradation and cost of organic matter transportation is high. A combination of chemical fertiliser with crop residue recycling, green manure, fodder crops or agroforestry can eventually improve the availability and quality of organic matter.

Zoning for strategy development

The viability of different options for soil fertility management depends on their economic profitability. Local agroecological and socioeconomic conditions make a considerable difference to the profitability of chemical fertilisers. This can be seen not only between regions but also between and within fields. A three-zone division can be made: Zone I chemical fertilisers are a profitable option; Zone II chemical fertilisers are only profitable after 'eco-intensification' through soil amendments as described above; Zone III chemical fertilisers even when combined with soil amendments cannot be used profitably. At present Zone II is by far the most prevalent in sub-Saharan Africa with high financial implications for moving towards zone I. The limits between zones can be influenced by agricultural policy and agro-technologies. Lower input prices, higher output prices and improved management, for example, can shift the cost-benefit break-even point between two zones to lower agroecological or socioeconomic conditions. Ideally, Zone I should be enlarged and Zone III should be eliminated to make market-oriented agriculture and agricultural intensification profitable for all farmers. To what extent this is feasible depends on the costs of support or subsidies necessary for the intervention.

In order to realize the same conditions in Zone II and Zone I at least temporary support has to be given. Support can be given

in different ways including a temporary subsidy on local phosphate rock, materials and equipment to facilitate organic matter transport and management, and/or appropriate credit mechanisms. The cost of these socioeconomic measures have to be seen as an investment in the re-capitalisation of soil fertility in order to make the use of chemical fertilisers and agricultural intensification in the interests of rural development and food security feasible. Soil fertility improvement is not simply a technology. It requires profound adaptations of agricultural policies, stimulating farmers to invest in their soils and the private sector to invest in agricultural input and output market development. Such investments will be cheaper and better achievable than those in irrigation in most Africa (Breman 1998).

The 'Soil Fertility Initiative'

The Soil Fertility Initiative (SFI) was launched in 1996 under the aegis of the World Bank and in partnership with many institutions including IFDC during the world food summit in Rome. The SFI aims at helping sub-Saharan African countries achieve sustainable increases in agricultural production while preserving the environment. These countries have been called upon to elaborate national strategies and action plans to secure improvements in soil fertility. Burkina Faso and Ghana were the first countries to formulate National Action Plans (NAPs).

The National Strategy in Burkina Faso

The first step in the formulation of the National Strategy was the creation of a Soil Fertility Management Unit (SFMU) attached to the cabinet of the Ministry of Agriculture. The SFMU was assigned the following responsibilities:

- The promotion and creation of awareness of the need to create a favourable environment for investments in soil fertility;
- The elaboration of a national strategy for integrated management and the restoration of soil fertility;



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- The elaboration of action plans to operationalise the strategy and
- The coordination of all soil fertility-related activities in Burkina Faso at national level.

The SFMU consulted extensively with the stakeholders (farmers, decision makers, input suppliers, agro-processors, transport operators, extension agents, researchers, development agents). A series of grass-roots workshops were organised during which discussions were held with stakeholders on the need and urgency for soil fertility restoration. These workshops provided the opportunity for developing a common understanding about the problems of soil degradation and for examining current practices in the light of what needs to be done. They also served as fora where ideas could be exchanged between research, extensionists, NGOs and others working on projects in the area of soil fertility maintenance. Awareness was also created through the publication of a bi-monthly magazine 'Sustainable Agriculture', which set out to inform stakeholders about soil fertility restoration. The SFMU also undertook a series of surveys to obtain information on farmers' strategies on soil amendments, accompanying technologies and developments in marketable products.

The process of sensitisation, inventorising the state of knowledge on soil fertility work in Burkina Faso, and setting up specialised committees to provide advice culminated in the creation of a national strategy. The process of the strategy elaboration was iterative and involved all stakeholders from the initial stages to its final adoption by government.

The strategy describes a vision and approach to restoring, improving and maintaining soil fertility. The action plans involved in the national strategy were as follows:

1. Action plan for the promotion of soil amendments
2. Action plan for the promotion of technologies that accompany soil amendments, and
3. Action plan for the development of input and output markets.

Action Plan 1 is based on the use of the rock phosphate and dolomite that occur naturally in Burkina Faso.

Action Plan 2 is based on available and proven technologies such as improved cultural practices with cereal-legume rotations, anti-erosion control techniques, the "zai" traditional planting pits, mulching, use of organic and chemical fertilisers, crop-livestock systems, agroforestry and water retention.

Action Plan 3 aims at creating the conditions necessary for farmers to invest in

soil fertility improvement. It includes actions that will raise the value-cost ratio of purchased inputs such as fertilisers. On the output side the action plan seeks to create effective demands for the products through agro-processing and value adding activities (Debrah 1998).

Lessons learned in Burkina Faso

In Burkina Faso experience reveals that the commitment of government, donors and technical assistance is extremely important in addressing the problem of soil fertility. The sensitisation, consultation and awareness creation process, although useful, was long, complicated and expensive. The large number of stakeholders involved made reconciling different positions and interests – including the role of SFMU vis-a vis the country's traditional soil research institute - difficult. Nevertheless the consultative and participatory approach to the formulation of national strategy was crucial. Many research and development projects designed to increase food production in SSA have failed because stakeholders were

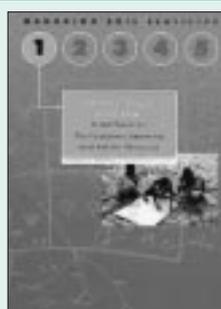
not involved in the process from start to final evaluation.

The Burkina Faso experience has shown that with the necessary elements in place it is possible, with consensus, to elaborate a concise strategy that provides an orientation for the regeneration of soil fertility. ■

For more information on the 'Soil Fertility Initiative' contact IFDC-A, BP 4483, Lomé, Togo.
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Managing Soil Fertility: A Resource Guide for Participatory Learning and Action Research

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This resource guide is based on extensive work done in several African countries. It is intended to provide user-friendly ways of gathering, managing and analysing information and data by using participatory learning and action research. It suggests ways of using this knowledge to develop strategies for integrated soil fertility management.

The Resource Guide has been developed to provide broad-based support for analytical and experimental work with farmers. It focuses on understanding how farming systems work, and outlines frameworks for analysing diversity - and particularly resource flows - in agroecosystems. However, it is intended to be much more than an analytical handbook. Hands-on experience is one of the most effective ways for farmers to learn new approaches, so the Resource Guide also outlines tools and procedures for each step in participatory learning and action research.

The main aim of the Resource Guide is to give field workers practical advice on how to work with farmers to improve soil fertility management. It is intended as a source of inspiration and help to field practitioners working to facilitate positive changes in farming communities. One of the greatest challenges is the wide variety of ecological and socioeconomic conditions found in neighbouring sites. With this in mind the Resource Guide provides advice on efficient ways of managing all possible sources of soil fertility, in other words, integrated soil fertility management.

The Resource Guide consists of five parts:

- Part 1 - Building common knowledge: A Textbook for Participatory Learning and Action Research (PLAR)*
- Part 2 - PLAR and Resource Flow Analysis in Practice: Case Studies*
- Part 3 - Field Tools for Participatory Learning and Action Research*
- Part 4 - The CD ROM: ResourceKIT (software package) and Detailed Field Tools (electronic version)*
- Part 5 - Detailed Field Tools for PLAR/User Guide to the ResourceKIT*

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