

The purpose of these *Key Sheets* is to provide decision-makers with an easy and up-to-date point of reference on issues relating to the provision of support for sustainable livelihoods.

The sheets are designed for those who are managing change and who are concerned to make well-informed implementation decisions. They aim to distil theoretical debate and field experience so that it becomes easily accessible and useful across a range of situations. Their purpose is to assist in the process of decision-making rather than to provide definitive answers.

The sheets address three broad sets of issues:

- Service Delivery
- Resource Management
- Policy Planning and Implementation

A list of contact details for organisations is provided for each sub-series.

Overview of the debate

In this sheet, the term 'soil fertility' describes the soil's ability to supply plant nutrients. It is also used in a wider sense to cover any soil property that influences plant growth. Nutrient management includes ways to recycle nutrients, replace lost nutrients with external inputs, and improve the inherent fertility of soils (e.g., by increasing organic matter and the availability of nutrients such as phosphorus).

Over the last 5 years the debate has focused on:

- Soil nutrient imbalances, nutrient 'mining', and the sustainability of nutrient-management practices.
- Ways to include nutrient management in wider livelihood and resource-management interventions.
- Soil fertility recapitalisation and attempts to raise awareness and coordinate approaches for this (e.g., the Soil Fertility Initiative for Sub-Saharan Africa).
- Increasing awareness that technical interventions alone are not sufficient; they must be integrated with institutional and policy elements to improve the management of soil nutrients.
- The strategic choices that determine investment in soils: e.g., the trade-offs between farmers' immediate needs (which may lead to nutrient mining) and longer-term sustainability.
- Ways to improve organic matter, or to make fertiliser more effective and profitable.
- The roles of the public and private sectors, especially in privatised, liberalised input markets.
- Appropriate policy responses to the withdrawal of mineral fertiliser subsidies.
- Methods combining local knowledge, practices and decision making with scientific approaches (such as participatory technology development).

Key issues in decision making

Soil fertility and nutrient management influence agricultural productivity, and hence food security and livelihoods. Soil problems and potentials are often over-generalised at national and regional levels, while soils and their management options are location- and situation-specific. The inherent fertility of many soils is low (particularly, but not only, in Africa) because of their clay and organic matter content. The low nutrient status of soils, and the loss of organic matter (through continuous cropping, burning and overgrazing) and nutrients (erosion and leaching), are key issues. Farming systems, especially combinations of crops and livestock, also influence management options. Replacing multiple crops with monocropping may raise demand for external inputs and increase pressure on the soil. Suitable socio-economic and policy environments to maintain and improve soil fertility may be lacking.

Improving soil fertility 'Nutrient mining' (extracting more nutrients than are returned) is a major factor impoverishing the soil. Massive replenishment programmes have been proposed, especially for phosphorus, but their economic benefit and long-term sustainability need case-by-case evaluation.

Governments and donors have promoted agroforestry, green manures and legumes, but these succeed only in some situations. Mineral fertilisers have had greater impact, particularly when subsidised, but continuously using them alone is not sustainable. Economic adjustment programmes have ended the subsidies, and fertiliser use in some countries has fallen sharply, particularly in marginal areas.

'Integrated soil-fertility management' is an ecological approach that uses locally available amendments and inorganic fertilisers in an integrated way. Standard technology packages, delivered in a top-down manner, are inappropriate; rather, approaches must help farmers make decisions based on a combination of their own knowledge and research-based options. 'Synergistic' fertility-management packages are being tested that include soil amendments like organic matter and rock phosphate, and wise fertiliser applications, aiming at sustainable and profitable crop production.

Programmes to promote fertiliser and improved seeds have had considerable impact for some marketable crops in high-potential areas. But remote areas and those with marginal agro-ecology are riskier, so often require different approaches.

Organic alternatives to mineral fertilisers, such as manure and compost, are bulky and often scarce and of poor quality. Using them needs a lot of labour – which is in short supply in many places. It is often the women who handle these materials. Improved transport and research to develop labour-saving techniques may overcome this problem.

The small but growing demand for organic food, and the higher prices it fetches, have stimulated organic production, often by smallholders. Certified organic systems prohibit the use of mineral fertilisers, but farmers may be confused if fertilisers are promoted in other circumstances.

The policy environment A wide range of macroeconomic conditions, policies and institutions affects farmers' willingness and ability to invest in their soil. Farming must be profitable, land and labour must be valued appropriately, and farmers must have easy access to functioning (liberalised) markets. Policies must promote investment in infrastructure and transport, and encourage the private sector to invest in markets for inputs and outputs.



DFID experience

- Human and social capital aspects of soil nutrient management (India)
- Participatory Soil Fertility Management (Ethiopia), Farmers Research Project

DGIS experience

- Agriculture, Man and Ecology programme (S India, since 1982)
- Burkina-Wageningen University cooperation
- Cooperation between KIT and Institut d'Économie Rural (Mali) and KARI (Kenya)
- Nutrient Network: 6 African countries with IIED, IDS, KIT, ETC & Wageningen Univ.
- Support to IFDC and the Soil Fertility Initiative

Expertise

- CGIAR centres, incl. CIAT, ICRAF, IITA, IWMI & WARDA
- EARO, Addis Ababa
- FAO, Rome
- IDS, Brighton
- IER, Bamako
- IFDC, Alabama & Lomé
- IIED, London
- ILEIA, ETC, Leusden
- INERA, Ouagadougou
- KARI, Nairobi
- KIT, Amsterdam
- Soils CRSP, USAID
- Tropical Soil Biology and Fertility Programme, Nairobi
- Univ. of Newcastle
- Univ. of Reading
- Univ. of Zimbabwe, Harare
- Wageningen Univ. & Research Centre
- World Overview of Conservation Approaches and Technologies, Berne

Land tenure is a major influence both on the maintenance of soil fertility and on the ability to intensify farming in a sustainable way. Recognising that farmers must have robust access rights to land if they are to invest in it, donors have supported land-reform programmes that increase the security of tenure. Yet improvements in land rights often result in only gradual improvements in productivity.

Support is needed for research to adapt existing fertility-management methods to specific areas, and to promote these techniques. Research on problems faced by the poorest farmers has been limited. A better understanding of the synergistic effects of soil amendments (such as manure and compost) and inorganic fertilisers is necessary. Institutional capacity is limited and also requires support.

Farmer empowerment and ownership, leading to planning of research and joint experiments, are critical. Extension and farmer-training are needed to advise farmers on how to save labour, manage livestock, and care for their soils. Programmes that equitably involve women farmers should be prioritised.

'Smart' (targeted and time-bound) subsidies might encourage farmers to adopt integrated soil fertility management methods, stimulate the availability of mineral fertiliser and mechanised transport, and increase possibilities for poorer farmers. The subsidies can be phased out at the end of the transition to effective soil fertility management. Long-term investments may be needed to protect marginal regions from desertification. Time-bound subsidies may be desirable:

- when fertiliser prices are high because of low demand and high transport and importation costs;
- to make small packages of fertiliser available at a reasonable price;
- to promote the use of a locally available source such as rock phosphate.

Many micro- or meso-level interventions to promote soil fertility fail because of an unfavourable macro-economic environment. There is a need for experimental and iterative policy making, stimulating feedback between field, regional and national levels, to make adjustments and foster progress.

Entry points for donors Soil fertility management should be part of broader sustainable production strategies and should not be targeted in isolation. Soil fertility is an essential natural capital asset and plays an important role in sustaining livelihoods. It needs support through appropriate policies, institutions and processes. Soil fertility is also an important entry point for livelihoods-focused development because it highlights policy linkages and provides an integrating focus for rural service provision.

Other appropriate priorities and entry points for donors include:

- Ensure that soil fertility concerns are addressed within sector-wide approaches and poverty reduction strategy papers, and in sustainable livelihood interventions.
- Ensure awareness of soil fertility issues at all levels, from farmers to policy makers.
- Support enabling environments, market development, infrastructure and access.
- Support the private sector to develop and manage input markets.
- Facilitate dialogue among stakeholders, and reinforce weaker groups so their voices can be heard.
- Support land-reform programmes that increase equity and security of tenure and create appropriate conditions for investments in soil fertility.
- Support interventions to enable farmers to become experts on their own land.
- Develop capacity for local policy analysis.
- Encourage regional cooperation to strengthen input markets and share research experience.

Key Literature

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Key Sheets are available on the Internet at: www.odi.org.uk/keysheets/
or through the websites of DFID and the Netherlands Ministry of Foreign Affairs



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