INTEGRATED SOIL FERTILITY AND WATER MANAGEMENT STRATEGIES FOR INCREASED CROP PRODUCTION IN THE ASALS OF KENYA

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Characteristics of the semi-arid areas of Kenya

Rainfall
- Low (600 - 800 mm per annum) and
- Unpredictable in terms of onset and amount

Soils
- Low in fertility and organic matter
- Shallow depth and susceptible to surface crusting and compaction

Water harvesting and integrated nutrient management is therefore viewed as an important strategy for increasing crop production in these areas while simultaneously conserving the environment.

Integration of crop and livestock management, use of household waste, composting and incorporating crop residues into the soil are ways to improve nutrient cycling within the farm being promoted.

Sub-soiling and ripping
- Sub-soiling to break the hard pan, followed by ripping to widen the furrows is an effective water harvesting technique in some areas of Eastern Kenya.

Soil fertility improvement options
- Application of animal manures provides a means of recycling nutrients but is usually available in insufficient quantities and of poor quality.
- Application of small quantities of inorganic fertilizers in combination with manures is recommended to increase the nutrient levels.
- Inclusion of legumes in rotations fix atmospheric nitrogen and thereby add external nitrogen to the crop-soil ecosystem.

Objectives
- To increase the efficiency of rain water utilization
- To add nutrients to replenish stocks and flows in the soil
- To block nutrient flows leaving the farm (leaks in the system) e.g. through soil erosion, leaching etc.
- To increase the efficiency with which nutrients are used by the various production systems.

Improved water management options

Tied ridging
- Tied-riding offers in principle good potential for water conservation.
- Lack of awareness of the benefits of the technology and extra labour required in making the cross ties are cited constraints to its adoption.