

New approaches for marginal and food-insecure areas:

The need for innovative, concerted action

The world population has already surpassed the 6 billion mark. This population, however, is unequally distributed between the so called «developed world» and «the least developed world» – the former with less than a quarter of the world's population but controlling over two thirds of the global economy. Achieving sustainable food security for all by 2020 seems to be an uphill task if no deliberate policy reform policies are put in place.

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The majority of the poor live in marginal areas characterised by severe land degradation, drought, lack of infrastructure, inadequate markets, no access to information and insufficient government support. The rural poor also face strong competition because the local markets are flooded with imported products from the developed world under the umbrella of «market liberalization». These products, usually packed in an attractive «modern» way, are sold at lower prices than local products and are preferred by the emerging middle class people, leaving the poor unable to place their products on the market.

Africa, Southern America and Asia have mostly farmers in this category, who are normally found at the bottom ladder of the so called global agricultural trading systems. A common feature is the size of their farms, which in most cases rarely exceed 5 acres and are increasingly becoming unviable as sustainable economic and social units. Farming families in the marginal areas are facing increasing food shortages. Population growth, decline of cultivable land, land degradation, dwindling soil fertility and mounting poverty aggravate food insecurity. As a result bush encroachment is on the rise, with more land being opened up, cultivated for few years and abandoned shortly after losing its fertility.

In marginal areas, higher food production to sustain the rapidly growing population requires intensive cultivation of land that involves bush clearing and further degrades the environment. Consequently, higher food production and minimizing the effects of environmental degradation are becoming conflicting objectives.

The rapidly expanding population uses limited traditional practices for soil improvement such as shifting cultivation and bush fallowing. Poverty is forcing



Photo: Bilaro

farmers to continuously use the same piece of land without investing in soil fertility. As a result, the poor people's struggle for self sustenance is leading to desertification which now adversely affects the lives and livelihoods of over 2 billion people living in the drylands that cover 40 percent of the earth's surface. Land degradation means a drop in agricultural productivity, reduces biodiversity, and degrades the environment while diminishing ecosystem resilience. Recognizing the severity of the problem, the United Nations have declared 2006 as the International Year of Deserts and Desertification.

Better food security for poor farmers in marginal areas calls for the promotion of innovative ideas that are compatible with the current socio-economic circumstance of smallholder farmers

Current status of smallholder farms

Small farms play an important role in maintaining food security and in Africa they account for over 90 percent of agri-

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Small plots of individual farms in the slopes of Uluguru mountains in Tanzania.



cultural production. However, farms on marginal lands are the most neglected and least supported areas in all countries. These neglected areas are mainly inhabited by smallholder farmers the majority of them being poor and having no incentives to invest in soil improvement or use improved germplasm. Marginal farms have to face many problems, such as the decline in international development assistance and the lack of improved drought and disease resistant crop varieties. Moreover, they compete with large farms for research results, which are often driven by the demands of privatized farms and greatly widen the gap between farmers in high and low income countries in terms of access to new productive technologies. The result is economic, environmental and social hardship for millions of poor farmers who practice subsistence agriculture in fragile environments. Farmers are challenged to improve land productivity with their limited skills and resources, such as keeping small ruminants, adopting water harvesting methods, and by investing in affordable technologies to improve soil fertility. To raise

food security in these areas sustainably, we need to integrate modern science into traditional livelihood systems. Also a coherent socio-economic political environment is needed to address the common goal of improving productivity on marginal lands.

The integration of scientific approaches

Science has helped the world to solve many problems. To be relevant, it must be focused on special needs. Space or nuclear technology in India and Iran, for example, have no relevance for resource poor farmers who are not sure what tomorrow will look like. Thus scientific approaches should be designed to address problems like soil salinity, disease pressure, and drought. Traditional local technologies have to be improved so as to raise people's living standards.

For many years now, the research community has been working hard to solve productivity constraints for resource poor farmers who are unable to purchase inputs like improved seed or invest in soil and water management technologies that require substantial initial capital investment. New, high-yielding, stress- and disease-resistant crop varieties of beans, cassava, corn, grass pea, orange-fleshed sweet potato, pearl millet, rice, sorghum and wheat are available, and are already raising food security in some of the poorest, desertification-prone parts of the world. This approach is also known as «Combating Desertification through Science».

New approaches like the Participatory Geographic Information System (PGIS) are making dramatic contributions to communities' ability to assert their rights over natural resources and protect their traditional knowledge and wisdom. PGIS practice is geared towards community empowerment through measured, demand-driven, user-friendly and integrated applications of geo-spatial technologies. It also allows local people with minimal basic training to use a vast array of geographic information management tools and systems to record data and other spatial information about their land and resources.

Affordable technologies

Improved approaches for natural resource management call for protecting the biophysical basis of agriculture, biodiversity, forests, livestock, soils and water – which are critical for meeting the threats posed by desertification.

Over the past few years, new technologies for soil improvement and water conservation have been developed, tested and proved suitable for the conditions of resource poor farmers in marginal areas. For example, a number of moisture conservation structures such as tied ridges and implements for minimum tillage are proving useful to allow normal crop development in areas with erratic rainfall. At the same time multipurpose crops have been identified, that can be used to improve the soil through atmospheric nitrogen fixation, suppress certain species of weed, provide feed and food and generate income.

Robust crops such as cassava which have little fertilizer requirements can change the lives of the poor. Cassava has the advantage of being relatively undemanding, and it thrives on poor and even exhausted soils. Cassava contributes to food security for many villagers vulnerable to malnutrition. Compared to cereals, cassava is a low-cost crop that supplies sufficient calories. For farmers living in peri-urban areas, cassava is a valuable cash crop with a flourishing market. In West Africa, the International Institute of Tropical Agriculture (IITA) has released new, more productive varieties that are resistant to a number of diseases as well as to drought.

In West Africa new techniques such as applying small amounts of fertilizer (micro-dosing) can increase grain yields by 30 to 50 percent. Cactus cultivation in the Maghreb region improves the income of poor farmers and offers additional sources of animal feed, at the same time the cactus plants prevent wind erosion and stabilize sand dunes. In East Africa, improved agroforestry practices contribute to regenerating nutrient-depleted soils and provide animal feeds. Watershed programs in Southern and East Africa are reducing soil loss and enhancing cropping intensity.

Socio-economic approaches

Existing cultural practices are shaped by the limited available resources and poor infrastructure for markets that force farmers to practice subsistence production for home consumption and to keep large herds of animals as a safety net at times of drought. Sustainable approaches need to take into consideration the need for access to markets, information and credits, including entrepreneurship skills to cater for the changing behaviours and habits of people in terms of food. Rapid population growth, which has a major influence on food needs, must be controlled; John Bargaarts from the UN Popu-

lation council suggests strengthening family planning programmes by providing women with the knowledge and means to regulate their fertility.

Policy issues to combat desertification

Participatory approaches are regarded as the most sustainable way of attaining long term objectives. Local participation in policy formulation and implementation ensures mutual responsibility and creates a sense of ownership. Policies for natural resource management need to be based on the local perspective and allow room for consultation with local people. Knowledge-brokering, policy dialogue and consultation are key elements of any government efforts to combat desertification. Experience shows that local knowledge and locally-adapted coping strategies are vital for equipping poor people to meet the challenges of recurrent drought, desertification and related production constraints.

Pro-poor policies will therefore focus on local ownership of resources by investing in economic growth, empowerment and effective provision of public goods. Special programmes for improving marginal areas need to be set up by the respective governments. Added-value for products from these areas and enterprise development to absorb these products need to be awarded top priority as these will attract serious investment and product standardization, leading to better pricing and competitive advantages over imported products. New incentives in seed supply systems and trade regulation involving opportunities for promoting local seed production like those adopted by FAO in Quality Declared Seeds (QDS) will boost production through usage of improved seeds.

Adding premium to local products – the case of Cassava

Crop processing ensures off-season availability thanks to longer shelf life, improved product quality and hence better pricing. It allows for product diversification, thus leading to multiple use and increased consumption. For example, a growing number of products are being made from cassava, ranging from animal feed through to starch used in the paper, food and textile industries. Packaging allows for ready-to-use products while reducing the bulky nature of the crop.

Nowadays, markets in increasingly populated urban areas combined with new technologies offer consumers cassava-

based products that are easy to use. Good examples can be found in the Caribbean, the Pacific and South America, especially in Brazil – the world's leading cassava producer. Cassava is processed in various ways, often on an industrial scale; the products – chips, cakes, frozen dishes – are sold in shops. Cassava flour is used as a partial substitute for wheat flour in making traditional bread. In 2002, the Brazilian Congress passed a law making it mandatory for bread to contain at least 20 percent cassava flour and 40 percent in pizza dough. The objective of this law is to reduce costly wheat imports and promote the commercial potential of local crops. Africa still lags way behind in this respect, though Nigerian bakers are now required to use 10 percent cassava flour in their bread.

A number of techniques have been developed by researchers in Latin America to extend the shelf life of cassava roots up to three to four weeks; one such technique is to dip the roots in wax or paraffin. Cassava as livestock fodder also has an interesting potential; in Cameroon for example, researchers estimate that poultry farmers could cut production costs by 40 percent if they use cassava as part of their chickens' diet. Also on a global scale, animal feed represents the main outlet for cassava.

However, improved processing technologies are crucial if production costs are to fall significantly and both producers and processors are to earn a better income. Major investments, both in technologies and in organising markets, are therefore essential if products from marginal areas are to become competitive on local and international markets. When these conditions are met such crops will not only play a role in ensuring food security; they will

also become a motor for rural development and income generation.

Conclusion

Agriculture in Africa is characterised by weak linkages to markets and external inputs, and the same applies in other parts of the world. Achieving sustainable food security for all by 2020 seems to be an uphill task if no deliberate policy reform policies are put in place. There is a need to recognize the rural poor as being primary actors in the development process and to promote poor people's strengths, skills and potentials by improving their access to different forms of capital (human, social, financial, physical, and natural) to enhance their livelihoods. This can be done by generating a favourable macro environment for rural and agricultural development that creates specific comparative advantages to promote positive micro-macro linkages.

Therefore, sustainable approaches to marginal areas must recognize that both men and women, especially in poor households, can engage in diverse and multiple activities that improve their livelihoods by maximizing income-generating activities while minimizing vulnerability and risk and achieving other household objectives (improved health, nutrition and education, etc.). These activities may include farm, off-farm and other non-agricultural activities, often linked with those carried out by both rural and non-rural households. The effectiveness and profitability of these diverse livelihood systems will vary, however, depending on the general development environment, each household member's access to and control of their asset base, their productive and reproductive roles and responsibilities, their capabilities and their linkages with other rural and urban actors. Innovative, concerted efforts are thus essential to tackle the specific problems.



Photo: Bifano

Information exchange between farmers and scientists is very crucial in designing appropriate and affordable technologies.