

WORKING PAPER 102

Bright Spots Demonstrate Community Successes in African Agriculture

F. W. T. Penning de Vries, editor

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International Water Management Institute

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Preamble

The International Conference on Successes in African Agriculture in the Greater Horn of Africa, held in Nairobi in November 2004, had three main sections: one on Regional Food Security, one on Commodity Successes and one on Community Successes. The summary document published by NEPAD provides a good overview of this Conference. This document presents four of the five papers presented in the Community Successes section, each enhanced after comments from participants and working group discussion sessions. It also presents an overall summary with lessons learned and a set of examples of Community Successes or Bright Spots.

Frits Penning de Vries
Editor

Foreword from NEPAD

Significant poverty reduction will not be possible in Africa without rapid agricultural growth. Only improved agricultural productivity can simultaneously improve welfare among the 75 percent of the population that works primarily in agriculture as well as the urban poor who spend over 60 percent of their budget on food staples.

Regrettably, past performance has proven inadequate. Sub-Saharan Africa remains the only region of the developing world where per capita agricultural production has fallen over the past 40 years. Clearly, African Agriculture must do better in the future than it has done in the past.

Fortunately, there are signs of changes for the better. On the one hand, the African Heads of State and Government, through the Maputo Declaration in July 2003, have made agriculture a top priority and committed to increasing budget allocations to 10 percent of the total outlays within 5 years. On the other hand, there are actually already many more and significant successes in African Agriculture than was previously recognized. Moreover, the generic aspects of these successes open doors for a much broader application across the continent.

Some of these successes can best be understood by considering the progress made with respect to the main agricultural commodities, some by investigating the major role that intra-regional trade can play, while a third category of successes can best be understood by considering them in a community context. It was a pleasure for NEPAD to be able to add the category of Community Successes as a main subject into its series of regional Conferences on Successes in African Agriculture.

The participants of the last International Conference on Successes in African Agriculture, Nairobi 2004 agreed on three pathways to follow through in Community Successes in Africa:

- Identifying Community Successes in integrated natural resource management, in particular among pastoralists.
- Developing an African network (or learning alliance) on participatory community development, and for documentation of community successes from many countries.
- Promoting development of more Bright Spots across Africa.

We thank the authors of this Working Paper and contributors to the Conference, as well as the sponsors of sessions on Community Successes (CTA, FAO, IFAD, IFPRI, InWent, IWMI, JKUAT) for their valuable contributions. Where possible, NEPAD will actively support the promotion of further explanatory research on Community Successes, and even stronger, promote attempts of outscaling and upscaling of Bright Spots in African Agriculture.

Prof. R. Mkandawire
NEPAD Agricultural Advisor

Foreword from IWMI

These are exciting times to be working on development in Africa. Until recently, the images of doom and gloom, and lack of hope for a better future, were dominant. While the reality of life for many millions of Africans is still not very bright, there is an important and historic shift underway. Africans at all levels are taking strong leadership and articulating visions and strategies to reverse what had been a vicious downward spiral and turn it into a virtuous spiral of improvement. The strong and active leadership by, among others, the New Economic Partnership for Africa's Development (NEPAD), which has strong political support throughout Africa, is one of the key drivers of this shift. There is considerable evidence that the rest of the world is mobilizing to support these new efforts to bring prosperity to Africa and its peoples. Recent commitments by the G8 and others to supporting early implementation activities under the Comprehensive Africa Agricultural Development Programme (CAADP) are evidence for this.

From the beginning NEPAD has made clear that it seeks partners who can help support its efforts. The International Water Management Institute (IWMI), comparatively new on the African scene, has sought to do just this: to make available our experience, professional capacities, and strong commitment to reducing poverty and promoting rapid and equitable economic growth by developing and managing water and land resources. We greatly value our strong partnership with NEPAD and other partners in Africa.

We are pleased therefore to have been able to assist in making the International Conference on Successes in African Agriculture in the Greater Horn of Africa, held in Nairobi in November 2004, the great success that it was. This volume is intended to make available to a wider audience the key findings and lessons shared at that Conference.

To conclude, I want to thank Dr. Frits Penning de Vries for his hard work and commitment that helped make the Conference successful and made this publication possible.

Douglas J. Merrey
IWMI Director for Africa

Chapter 1

Lessons Learned from Community Successes: A Cause for Optimism!

F.W.T. Penning de Vries,¹ B. Mati,² G. Khisa,³ S. Omar⁴ and M. Yonis⁴

ABSTRACT

This paper integrates the ideas and findings of four presentations in the section “Community Successes” at the Nairobi NEPAD Regional Conference and those of the facilitated discussion sessions during the conference. The four presentations are also documented in the following chapters. We will focus here particularly on “lessons learned” with respect to outscaling (more of the same) and upscaling (expansion to larger regions and higher levels of governance) of such successes.

KEYWORDS

rural development, community successes, livelihood approach, reversing degradation of land and water.

INTRODUCTION

Much of Africa shows a very discouraging picture with respect to development: degradation of land and water is widespread and serious; there is increasing labor scarcity and HIV/AIDS; and no reduction in large-scale poverty and hunger (Wood et al. 2000; Penning de Vries 2001; Penning de Vries et al. 2002). The comprehensive report by the UN Millennium Project (2005) and the analysis by the InterAcademy Council (Kazibwe et al. 2004) show that there is much hope and that there are certainly big opportunities for both rural development and agriculture in Africa. The International Conference on Successes in African Agriculture demonstrated that there are already quite a few positive developments in breeding and agronomy of key commodities, particularly maize, cassava, cotton, dairy, as well as in intra-regional trade in the commodities, that allow for optimism (Haggblade 2004). A NEPAD Conference in Nairobi on Successes in Agriculture in the Greater Horn of Africa added to these successes and successful development in communities, and these were called Bright Spots (Haggblade 2005).

The five documents presented in this volume show clearly that Community Successes already exist in many countries of Africa. During the discussion sessions at the Conference, many participants mentioned that in other regions and countries too good cases of “community successes” do exist but are not yet reported. This indicates that the reported successes are not unrepresentative “outliers.” And even better, analysis of the ways in which these communities became successes, or Bright Spots, showed that there are drivers of these processes that can be repeated or introduced

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and specific constraints that need to be removed, and these success stories are not coincidences of circumstances that cannot be repeated purposefully.

Bright Spots have been documented in poor rural areas of other continents (Noble et al. 2005b). Similar phenomena have also been reported in other fields, such as development of small and medium enterprises (Banuri et al. 2002), sustainable agriculture (Pretty and Hine 2004) and African agro-forestry (ICRAF 2004). This strengthens our thinking that there is some commonality between the processes of development of successful enterprises and communities. There are also successes of large-scale commercial farming in Africa. Developments of such enterprises are not analyzed here.

METHODS USED IN THE FOLLOWING CHAPTERS

There are very many elements in the process of development of communities. The requirements for rural development can be grouped into five categories of “capitals” according to the method of livelihood analysis, as described by DFID (FAO 2005). The following are these capitals:

- human capital (skills and knowledge, health)
- social capital (organizations, regulations, policies, trust and security, gender equity)
- natural capital (water, land, genetic resources)
- physical capital (infrastructure, equipment)
- financial capital (savings, loans)

If one of these capitals is insufficiently available, it handicaps development, e.g., if social structures are inadequate, then more money does not help unless it can remedy the shortage of the social capital. Development should therefore be targeted at the smallest “capital.” In a way, the livelihood analysis has been behind the common approach to understanding the successes of Bright Spots: which capitals were lacking most, and how did the community go about altering that? What were the “drivers” behind the emergence of community successes? While thorough descriptions and characterization of Bright Spots are nice and needed, it is more important to present an analysis of why and how these emerged. Such explorative studies can provide generalizations and the derivation of principles that can be applied in other cases. What we aim for in this Working Paper is a generic picture of how Bright Spots have developed.

The research methods employed in the following chapters range from extensive surveys to field visits and documentation of results and processes in ongoing projects. Many hundreds of individual cases were investigated from a wide range of social and biophysical conditions. This gives credibility to the broad conclusions of the analyses and allows us to carefully promote their concept and applicability. But we realize there is also much room for providing “harder” proof of successes, and more extensive and more practical information about drivers and conditions for commodity successes. For instance, there are no successes described here in livestock, in agro-forestry or in natural resources management (Kwesiga et al. 2003).

The first paper (Noble et al. 2005a) gives a broad overview and careful analysis of cases of Bright Spots in Africa. This paper sets the scene for Bright Spots and for the remaining chapters. The second paper (Mati and Penning de Vries 2005) presents situations where new availability of small-scale technologies and the connection to markets provided rapid breakthroughs in East Africa. Several of their cases are good illustrations of individual Bright Spots, and are presented in more detail in the chapter on “Case Studies.” The third paper (Omar and Yonis 2005) presents a situation where integrated community development in the very poor environment of Somaliland has brought remarkable successes through building of social capital and human capital, and with small doses of credit and technology. In this paper, the community development process emphasized more than the resulting Bright Spots. The fourth paper (Khisa and Heinemann 2005) presents a combination of new knowledge of innovative technologies and building of social capitals in East Africa through adult education in the so-called Farmer Field Schools. Also in this paper there is more emphasis on the successful methodology than on the resulting community successes. The last chapter presents case studies that add no new information as such but that illustrate what we mean by Community Successes and Bright Spots. This chapter includes a copy of the questionnaire that Noble and colleagues used to identify and document Bright Spots.

FINDINGS

The concept

Bright Spots are community successes. They are characterized as agricultural communities and households that are doing much better than neighboring ones despite environmental, social or demographic pressures. Around 1 percent of the African rural population already falls within this category; maybe more. Bright Spots can grow and multiply, and cover much of the region or country after some time. (In the Brazilian state of Paraña, for instance, 30 years ago some communities started to adopt no-till as a better cultivation technology and, by now, it has been adopted in the entire state with concomitant increases in productivity, income and sustainability.) Bright Spots do not refer to strictly geographically bounded communities, but can comprise groups (professional, cultural, age) within communities.

Beneficiaries

Community Successes are self-selecting the poorest in the studies of Noble et al. (2005a) and Khisa and Heineman (2005) where income, livelihood and education improve. Women are at least equal in gaining benefits of the successes, and the paper by Omar and Yonis (2005) shows how empowerment can benefit women and give them active roles in successful communities. The environment (soil and water quality) was also reported to improve, sometimes significantly. In another study benefits in C-sequestration were computed and found to be significant (Pretty, pers. comm.). Even though hard proof is still not there, indications are that improved livelihoods and incomes also contribute to improved environments and *not* lead to stronger exploitation and degradation of the natural resources.

The Drivers

Noble et al. (2005a) distinguish four types of drivers:

- spontaneous (i.e., where individuals drove the process)
- social (where informal organizations championed the process)
- technological (with either new hardware or information about it)
- external (facilitators, markets or donors)

The first type of driver can be seen as expanding the human capital, the second as a way to improve the social capital, the third as expanding the physical (and indirectly the natural capital, e.g., when a pump increases water availability), and the fourth a way to improve some of the community capital as well as local conditions (e.g., access to physical and financial capital and funds). This suggests that before embarking on attempts to promote rural development, it is important to establish which of the drivers are lacking or underdeveloped, and which ones are already present.

The Conditions

Some external conditions may constrain the development of Bright Spots but may be beyond control or too large for communities. Such conditions include lack of effective policies on access to all to water or land tenure, lack of market access, lack of technologies and lack of water. Removing these constraints requires activities at a higher level than the community, such as the local and national governments. Improving the boundary conditions for development of communities is one aspect of upscaling rural development. Removal of some constraints may not be feasible at all (e.g., increasing water supply in arid regions has hard limits; connecting remote villages to markets requires much time) and effort to promote agricultural development will then be wasted.

Upscaling

It may be unrealistic to expect Bright Spots to cover 100 percent of the area, as natural resources, land and water in many parts of Africa are not abundant. But major upscaling beyond the current 1 percent of the rural people is what all reports recommend. Careful extrapolation of the capitals required for major upscaling may warn us when limits are approached (e.g., on natural capital when water resources are overdrawn). The socioeconomic, biophysical and institutional factors that need to be in place to allow Bright Spots to be sustainable need to be scrutinized in follow-up studies.

Cost

In one paper (Noble et al. 2005a), the cost of developing Bright Spots was found to be around \$400⁵ per hectare derived from public funding but with significant contributions from the community itself. The cost reported from Farmer Field Schools may be in the same order of magnitude. These costs compare very favorably with those for public investment in development of formal irrigation

⁵In this Working Paper, \$ means US\$.

schemes in Africa that are at least 10 times higher (Inocencio et al. 2005). It should be noted that, given the right conditions, communities and households can contribute significant private funding for innovations and that providing formal credit and subsidies may not be necessary (or even helpful).

Speed

Perhaps surprisingly, poor and marginal communities can become Bright Spots over a 3-5 year period only. All papers give examples. Even degradation of soil and water has been reversed substantially in such a short period. This aspect, combined with the relative low cost makes promotion of Bright Spots a very attractive business proposition for donors and governments.

Ecologies

Examples of community successes were provided in all agro-ecologies and cropping systems in Africa, except in the arid zones, humid rainforests and pastoral communities. Yet, conference participants from these areas indicated that Community Successes exist there as well and that documentation would be very welcome. The urban and peri-urban areas can provide a particularly fruitful ecology as purchasing power is present, and urban (waste) water and compost from the peri-urban food industry provide valuable natural capital (Drechsel and Kunze 2001).

LESSONS

There are many Bright Spots in Africa, Asia and Latin America. Only a few have been documented. Expansion of an inventory will be highly valuable.

Bright Spots are small communities or households that have improved their livelihoods and natural resources significantly despite having degraded biophysical and socioeconomic conditions around them.

Bright Spots can emerge once a number of conditions are met and certain drivers are present. Innovations are required as a rule. Lack of ambition in the communities and lack of basic education are among the constraints that should be overcome.

Rural development through promoting Bright Spots can be relatively fast and cheap. They provide good business opportunities for the government and for donors. Women benefit at least as much as men. The natural resource base becomes rehabilitated.

“Drivers” are needed. They can be in the form of strong individuals, new community organizations, innovative technologies and practices, or external agents. The drivers need to bring to a minimum level the human, social, financial, physical and/or natural capital. The capital that is missing needs to be created/added/promoted. NGOs, government programs/donor programs can help.

Conditions that may need to be met to allow major upscaling of Bright Spots include: markets for products, security, policies, institutions and basic education. The main condition(s) missing need to be created/added/promoted by government programs and the private sector. In Bright Spots, fields with the lowest productivity improved most. This suggests that new Bright Spots could be targeted at the poorest people.

CONCLUSION

This report presents a preliminary view of the generic picture of how Bright Spots develop. It also provides a direction for how research can support rural development. Guidelines for promotion of Bright Spots could be drafted on the basis of the lessons learned. Analysis of cases where Bright Spots have appeared to be unsustainable is needed.

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Chapter 2

Development of Bright Spots in Africa: Cause for Optimism?

A.D. Noble,¹ J. Pretty,² F.W.T. Penning de Vries,³ and D. Bossio⁴

ABSTRACT

Degradation of land and water poses a serious threat to food security and the livelihoods and well-being of marginalized rural communities in Africa that occupy degradation-prone marginal lands. This issue is of particular relevance in countries where expansion of agricultural enterprises through exploitation of new land and water resources is exhausted and migration of communities to new areas is restricted. It also contributes to persistent poverty, and results in decreasing ecosystem resilience and provision of environmental services. However, there are isolated examples around the globe of interventions that have been effective in reversing the continuing downward spiral of poverty and hopelessness with positive impacts on land and water resources. These are often termed Bright Spots in the literature and can best be described as a positive aberration from the common situation, and are characterized by individuals or communities that have made changes, which have led to a reversal of degradation of land and water.

The analysis of Bright Spots indicates that in the year 2000, some 1.79 million farmers on 1.91 million hectares of land have adopted improved land and water management strategies that have had a significant impact on yield and the environment. A weighted average increase in relative yield, based on area of adoption and average productivity increases for the 110 projects analyzed, was estimated to be 2.56. From an analysis of a limited number of Bright Spot cases the average investment in order to achieve the changes in Africa was estimated to be \$366 ha⁻¹, which is considerably lower than similar investments in Latin America. These investments were made with public funds, whereas private funds from farmers and entrepreneurs were not made explicit. Indeed, it is argued (Inocencio et al. 2005) that major private funds for small-scale investments will become available if investment conditions are made more favorable. Investment costs in formal irrigation schemes in Africa from public sources were found to be some 10 times larger than for the Bright Spot cases studied. The large difference between Bright Spots and investments in formal irrigation schemes is striking. If further development and replication of Bright Spots are contingent on significant financial and nonfinancial resources, the ability to replicate and upscale these successes will inevitably be restricted, questioning the concept of growing these successes. Without continued and sustained increased investments in development projects along with innovation at a scale possibly commensurate with that of Latin America, the probability of scaling up these and other Bright Spots in Africa is remote.

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We have identified three types of Bright Spots namely spontaneous, technical and community-based successes, each with its own key drivers. Spontaneous Bright Spots are those where significant improvement was made in resource condition and profitability without external investment, being driven by strong individual leadership and availability of appropriate technology. Technical Bright Spots are associated with a large extent due to strong individual initiative and because the new technology or knowledge was particularly appropriate and effective. Community Bright Spots such as integrated watershed development are those in which investment in social capital, such as community organizations, was as important as technical inputs for success and sustainability. We conclude by discussing the key attributes of Bright Spots and the drivers that effect their development.

INTRODUCTION

Despite the fact that improvements and innovations in technology have raised global food production and supply, it is estimated that approximately 800 million people globally are food-insecure of which 62 percent reside in less-developed countries of Asia and 25 percent in sub-Saharan Africa (Wiebe 2002; Pretty 2003). It is estimated that some 2.8 billion people still struggle to survive on less than \$2 a day. Half a billion people live in countries defined as water-stressed or water-scarce and by 2025 this number is predicted to rise to between 2.4 and 3.4 billion (UNFPA 2004). Unsustainable consumption and production patterns coupled with rapid population growth have had a significant impact on the environment. More people are using more resources with greater intensity, leaving behind the distinctive “footprint” of environmental degradation in their wake. A rapidly growing global consumer class, whose appetite seems insatiable, is using resources at an unprecedented rate, with an impact far greater than their numbers would suggest.

Most of the aforementioned poor and marginalized communities live in the developing world where growth in agricultural output is rapidly declining in part due to degradation of land and water (Wood et al. 2000; Penning de Vries et al. 2002). Degradation of land and water is an extensive and daunting environmental issue affecting global food security, especially in Africa. All regions of the continent suffer from environmental degradation. There is virtually no inhabited area of Africa that is not prone to degradation (Nana-Sinkam 1995). It is estimated that 65 percent of cropland, 30 percent of pastureland and 19 percent of forestland are degraded in Africa (Scherr and Yadav 1996). Resource degradation affects crop yields and has, often, untold hardships on the lives of rural farmers. Thus Scherr and Yadav (1996) recorded an estimated continent-wide loss in crop yields to be between 2 percent and 40 percent with a mean of 8.2 percent for the entire continent and 6.2 percent for sub-Saharan Africa. Bridges et al. (2001) and Penning de Vries (2001) underline that actual degradation has often proceeded further than yield losses indicate. Indeed, the relatively slow rate of growth of African agriculture (at 2.5% per year over the past 40 years, a little less than population growth: [Haggblade et al. 2003]) can be understood by moderate increases in crop yield potentials through the use of improved varieties that are canceled out by degradation of land and water resources.

Despite the abundance of natural resources in sub-Saharan Africa, the average gross domestic product (GDP) in constant prices was lower at the end of the 1990s than in 1970 (World Bank 2000). Approximately 16 percent of the region’s population live in countries that have an average GDP per capita of < \$200; 36 percent live in countries with an average GDP per capita of < \$300; and as many as 75 percent live in countries with an average GDP per capita < \$400 (World Bank 2000). In the region as a whole, an estimated 43 percent of the total population is classified as falling below either the international dollar poverty line or below nationally defined poverty lines.

Agriculture accounts for 20 percent of the region's GDP, employs 67 percent of the total labor force and is the main source of livelihoods of the poor.

Degradation of land and water poses a serious threat to food security and the livelihoods and well-being of rural populations in Africa that occupy degradation-prone marginal lands (Wood et al. 2000; Penning de Vries et al. 2002). It also contributes to persistent poverty, and results in decreasing ecosystem resilience and provision of environmental services (Costanza et al. 1997). Poor farmers tend to be associated with marginal lands and low yields (Rockström et al. 2003). This issue is of particular relevance in countries where lateral expansion of agricultural enterprises through exploitation of land and water resources is exhausted and therefore migration of communities to new areas is restricted. There are isolated examples around the globe of interventions that have been effective in reversing the continuing downward spiral of poverty and hopelessness with positive impacts on land and water resources. These are often termed Bright Spots in the published literature and can best be described as an aberration from the common situation and are characterized by individuals or communities that have made changes, which have led to a reversal of degradation of land and water (Scherr 1999). These so-called Bright Spots can be defined as individuals, small communities and households that have adopted innovative practices and strategies to reverse natural resource degradation in a sustainable manner whilst maintaining or enhancing food security. Bright Spots by their very nature are potentially sustainable, and levels of natural resource capital are above ecological and economic thresholds.

There are numerous documented examples and case studies that have been undertaken where individuals or communities have made changes, which have significantly increased their livelihoods and well-being with positive impacts on resource sustainability (Critchley et al. 1999; Banuri et al. 2002; Mutunga and Critchley 2001; Pretty and Koochafkan 2002; Critchley and Brommer 2003; Pretty and Hine 2004; Wu and Pretty 2004). These individuals and communities have adopted simple nonexploitive innovations to their production systems that have enhanced food security at the household level and increased incomes. These Bright Spots effectively represent positive changes and give us cause for cautious optimism in that there is this quiet movement towards the adoption of sustainable farming practices that result in enhanced livelihoods with positive outcomes to the environment.

In the current study, we attempt to quantify the extent and impact of Bright Spot development in Africa through data analyses from different sources; undertake an in-depth analysis of documented selected Bright Spot cases investigating the key drivers associated with their development; and to propose key attributes that need to be present when identifying the existence of Bright Spots and possible components required to create them.

METHODOLOGY

Assessing the Extent and Impact of Bright Spots

In assessing Bright Spot cases of Africa, we have drawn upon studies in both the public domain and gray literature; data captured in the SAFE world database of the University of Essex (Pretty et al. 2003; Pretty et al. 2000; Pretty and Hine 2001) that effectively assess the Global extent of Bright Spots, which are predominantly based on sustainable organic systems with limited reliance on fossil-fuel-derived inputs; and data captured through a survey of success cases undertaken within a Bright Spots project of the Comprehensive Assessment on Food and Water (Noble et al. 2004). The structure of the aforementioned questionnaire is presented in chapter 6 together with examples of concrete

cases. Within each of the databases, individual cases were classified into the major farming systems as defined by Dixon et al. (2001). Eight broad categories of Dixon et al. (2001) were based on social, economic and biophysical criteria and included the following:

1. Irrigated rain-fed farming systems—include a broad range of food and cash crop production systems.
2. Wetland rice-based farming systems—predominantly dependent on monsoonal rains with supplemental irrigation.
3. Rain-fed farming systems in humid and subhumid areas—characterized by crop activities that include any, or a combination, of the following crops: root crops, cereals, industrial tree crops—both small and plantation—and commercial horticulture, or mixed crop-livestock systems.
4. Rain-fed farming systems in steep and highland areas—often mixed crop-livestock systems.
5. Rain-fed farming systems in dry or cold areas—mixed crop-livestock and pastoral systems merging into sparse and often dispersed systems with very low productivity or potential due to extremes of aridity or cold.
6. Dualistic farming systems with both large-scale commercial and smallholder farms—across a variety of ecologies and with diverse production patterns.
7. Coastal artisanal fishing mixed farming system—often mixed farming systems.
8. Urban-based farming systems—typically focused on horticultural and livestock production.

Within these 8 major farming systems, 72 specific farming systems were identified, some comprising similar systems occurring in different continents (Dixon et al. 2001).

Drivers Associated with the Development of Bright Spots

A survey of proposed key drivers associated with the development of Bright Spots investigated factors that have led to the development of selected Bright Spots in Africa. It was undertaken using a questionnaire survey previously outlined by Noble et al. (2004) and presented in chapter 6. The questionnaire contained opportunities for the respondents to provide information on productivity increases that had accrued through the adoption of improved sustainable practices, the degree of adoption, and the role of key drivers in effecting change. In evaluating the drivers associated with the development of Bright Spots, ten key elements were identified as being of importance with respect to their development, namely:

1. *Quick and tangible benefits.* Immediate tangible benefits to the community or individual are a prerequisite for the development of a Bright Spot. This may include increased yields within the first year of implementing changes or a reduction in the costs of labor.
2. *Low risk of failure.* Resource-poor farmers, by their very nature, are risk-averse; hence any change to the current *status quo* must have a low level of risk associated with it.

3. *Market opportunities.* If there is to be a change in practices that are contingent on the production of new or alternative crops/products, markets need to be present and assured to effect this change.
4. *Aspiration for change.* This reflects an internal demand by an individual or community for change that may be driven by faith or wish to try something different.
5. *Innovation and appropriate technologies.* External and internal innovations, new technologies and information are important components in change. With respect to internal innovation and appropriate technologies this would include the revival of traditional/local knowledge. External innovations reflect new developments in techniques and technologies that, if adopted, effect a positive change to the production system. This includes new skills and knowledge that contributed to the development of a Bright Spot.
6. *Leadership.* Often, a single individual or group may become the champion/s for change. In addition, the initial involvement of an external facilitator such as an NGO or government agency may be required to take on this role.
7. *Social capital.* These are community organization, networks and partnerships (private as well as public) that develop in order to promote change. These have the elements of bonding, bridging and linking within the community.
8. *Participatory approach.* Deliberative processes that actively involve the community in the decision-making process. This has a strong element of learning and teaching and involves the establishment of a partnership between farmers and the development workers.
9. *Property rights.* The element of individual property rights and ownership may enhance the willingness of individuals to invest in assets thereby facilitating change.
10. *Supportive policies.* Changes in policies at the local, regional and national levels will facilitate the development of Bright Spots.

All of the questionnaires returned along with any other secondary material collected within the public domain and gray literature were individually added to a database. Each of the returns was checked to identify gaps and ambiguities. Those questionnaires that were deemed to be untrustworthy were rejected. It should be noted that the questionnaire was self-completed by individuals who were intimately involved in the case/project.

RESULTS

Quantification of the Current Extent and Impact of Bright Spots in Africa

A total of 110 cases from the SAFE project (Pretty and Hine 2001) and a further survey undertaken by Noble et al. (2004) contained sufficient information to estimate the extent and impact of Bright Spots in Africa. On average, these Bright Spots sustained 4.6 persons per hectare with a range of 0.2 to 13.1. In total, 1.79 million farmers on 1.91 million hectares have adopted improved land and water management strategies that have had a significant impact on yield and the environment

(table 1). The largest number of farmers impacted through the development of Bright Spots was under rain-fed humid systems followed by smallholder irrigated schemes (table 1). Wetland rice-based and coastal artisanal fishing were underrepresented in the cases collected. It is important to note that the development of a Bright Spot through the adoption of sustainable agricultural production systems may result in improved domestic food consumption and/or increased sales through home gardens, and/or better water management, without necessarily affecting the per hectare yields of crops (Pretty and Hine 2004).

Table 1. Extent of impact and adoption of Bright-Spots based on the data from the SAFE-World database (Pretty and Hine 2001) and Noble et al. (2004) and categories according to the farming systems classification of Dixon et al. (2001).

| Attribute | Farming system | | | | | | | |
|---|--------------------------------------|---------------------------|-----------------------|--------------------------|--------------------------|--------------------------------|----------------------------------|--------------------|
| | Smallholder irrigated schemes (1) | Wetland rice-based (2) | Rain-fed humid (3) | Rain-fed highland (4) | Rain-fed dry/cold (5) | Dualistic (large/small) (6) | Coastal artisanal fishing (7) | Urban-based (8) |
| Number of entries | 17 | 0 | 61 | 10 | 18 | 1 | 0 | 3 |
| Adoption area (ha) | 357,296 | 0 | 875,260 | 51,8804 | 154,833 | 6 | 0 | 65 |
| Numbers of population affected | 172,389 | 0 | 1,426,957 | 104,906 | 90,293 | 70 | 0 | 850 |
| Relative increase (1.00 indicates no change) | 2.75 | 0 | 2.32 | 2.96 | 2.22 | na | 0 | 1.71 |

na = not available.

Sub-Saharan Africa contains a total population of 629 million of which 384 million are classified as agricultural (Dixon et al. 2001). The total area under cultivation or permanent crops is estimated to be 173 million hectares (FAOSTAT 2003). Whilst the number of cases assessed in this analysis is by no means exhaustive and is limited to the data captured in the aforementioned databases, they would represent a fraction of the total number of Bright Spots that exist in Africa. The direct extent of impact of these Bright Spots from a total area and population perspective is 1 and 0.5 percent, respectively. Although these values appear to be low there is cause for cautious optimism in that there is clear evidence that farmers are adopting improved, sustainable production practices that have a positive impact on food security at the household level, improved livelihoods (increased income) and tangible benefits to the environment as a whole. Indeed, the potential benefits associated with the adoption of sustainable farming systems on carbon sequestration and water productivity have been shown to be significant (Pretty and Koohafkan 2002; Pretty and Hine 2004). Clearly, these positive environmental and financial benefits that would accrue through the development of Bright Spots lie beyond the “farm gate” and would invariably be significantly greater than covered in this analysis.

The development of a Bright Spot has had a significant impact on agricultural productivity as measured in terms of changes in crop yields before and after the adoption of improved production practices (table 1). A weighted average increase in relative yield, based on area of adoption and

average productivity increases for the 110 projects analyzed, was estimated to be 2.56. The largest increase in yields was observed in rain-fed highland systems (2.96) whilst the lowest was observed in urban-based systems (1.71) (table 1).

Reliable yield data for different commodities were obtained from 97 projects and are presented in table 2 and descriptively for different commodity groupings in figures 1 and 2. Clearly, it is evident that there have been substantial increases in productivity associated with the adoption of improved farming practices. This has been brought about through the adoption of improved technologies and practices that have included improved water use efficiencies associated with supplemental irrigation and multiple cropping; improvements in soil fertility associated with organic-based farming systems; and improved weed and pest control with a focus on minimal to low pesticide usage.

Table 2. Mean yields and standard error of the mean for before and after the development of the Bright Spots for returns from 97 cases in Africa. Values in parentheses are the range of observed values.

| Crop | Number of observations | Yield before (t ha ⁻¹) | Yield after (t ha ⁻¹) | Relative increase (1.00 indicates no change) |
|----------------|------------------------|------------------------------------|-----------------------------------|--|
| Banana | 1 | 15 | 60 | 2.94 |
| Bean | 5 | 1.01±0.29 | 2.87±0.83 (0.3 – 1.78) | 2.94±0.44 (0.6 – 5.55) |
| Cassava | 2 | 10.0 | 15.5 | 1.50 |
| Cotton | 4 | 0.86±0.42 | 1.02±0.53 (0.3 – 2.1) | 1.15±0.85 (0.3 – 2.6) |
| Groundnut | 2 | 0.60 | 0.98 | 1.75 |
| Maize | 37 | 1.08±0.11 | 2.49±0.29 (0.2 – 2.8) | 2.59±0.30 (0.4 – 9.0) |
| Millet/sorghum | 16 | 0.68±0.12 | 1.50±0.23 (0.3 – 2.0) | 2.68±0.47 (0.5 – 4) |
| Onion | 6 | 6.71±1.77 | 9.86±2.36 (0.7 – 10.0) | 1.65±0.18 (1.2 – 15.0) |
| Pepper | 1 | 0.7 | 0.9 | 1.28 |
| Potato | 1 | 6.0 | 20.0 | 3.33 |
| Rice | 5 | 2.26±0.76 | 6.10±1.77 (0.3 – 4.0) | 2.79±0.48 (0.5 – 10.0) |
| Soybean | 4 | 0.58±0.17 | 1.01±0.19 (0.3 – 1.1) | 1.88±0.25 (0.6 – 1.5) |
| Sugarcane | 2 | 0.37 | 0.74 | 2.21 |
| Sunflower | 1 | 0.5 | 1.8 | 3.60 |
| Sweet potato | 2 | 6.0 | 35.0 | 5.85 |
| Tomato | 2 | 11.0 | 15.7 | 1.35 |
| Vegetables | 1 | 5.0 | 15.3 | 3.06 |
| Wheat | 5 | 0.82±0.07 | 2.32±0.28 (0.6 – 1.0) | 3.06±0.64 (1.6 – 3.0) |

Figure 1. Relationship between yield before the implementation of innovative and sustainable farming practices and the relative change in productivity associated with Bright Spot development for field-based crops. Total number of crop yields: 80.

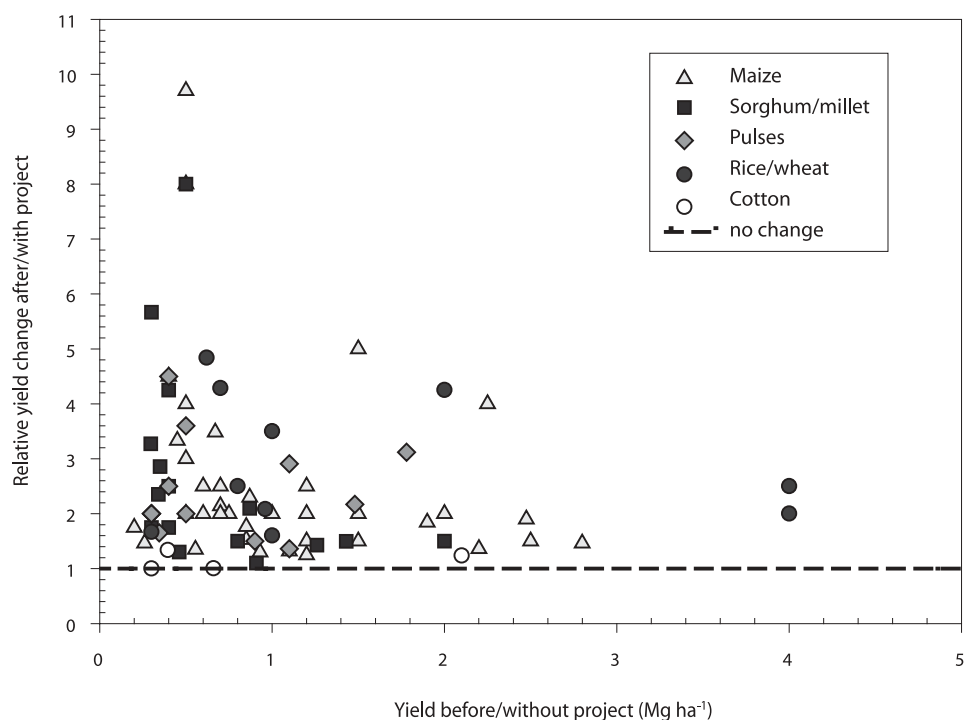
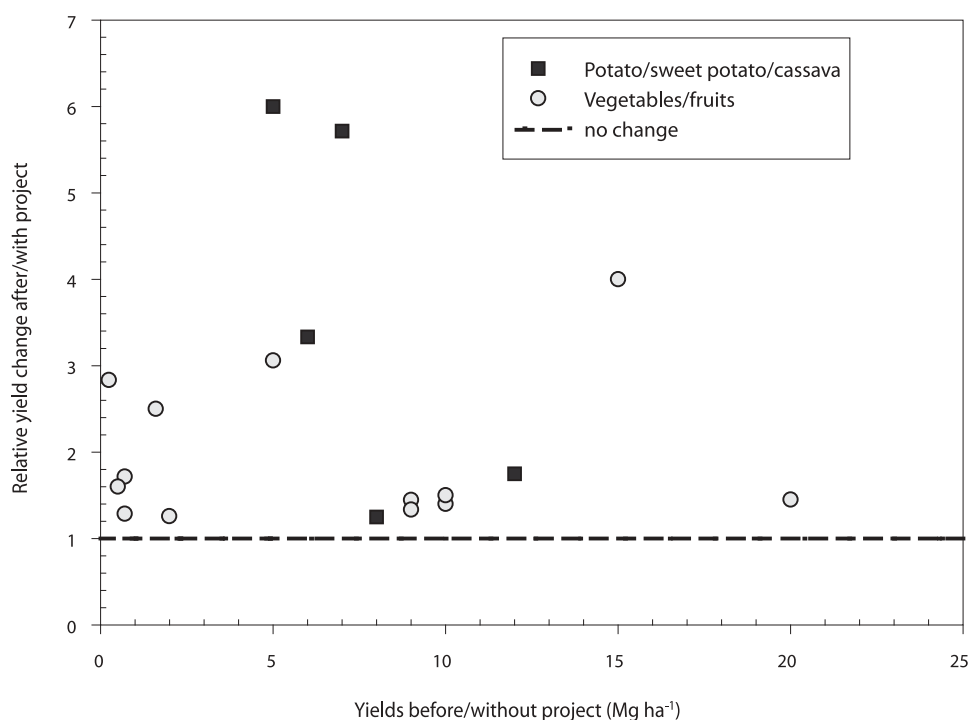


Figure 2. Relationship between yield before the implementation of innovative and sustainable farming practices and the relative change in productivity associated with Bright Spot development for vegetables, fruits and root crops. Total number of crop yields: 18.



Selected Case Studies from Africa

The questionnaire returns from Africa in a survey undertaken by Noble et al. (2004) were dominated by small-scale irrigation projects (n=11) out of a total of 16 cases. The remaining cases focused on community-based projects that had a focus on promoting farmer innovation, enhancing conservation practices and mobilizing communities in sustainable resource management. Of the 16 cases, 10 were from Ethiopia/Tigray, 3 from Kenya, 2 from Ghana and 1 each from Zimbabwe and Madagascar (figure 3).

Figure 3. Location of selected Bright Spots from Africa included in the survey of Noble et al. (2004).



The mean annual rainfall for the cases was 642 mm with a range of 400–1,800 mm. The majority of the cases (14) were located in regions where the mean annual rainfall was less than 700 mm. This would, in part, explain the propensity of irrigation-based cases that had a focus on increasing the availability of water resources in an effort to improve crop productivity and cropping intensity. The dominant crop in most of the cases was maize followed by onion (table 3). The mean yield of maize after the development was $1.7 \pm 0.26 \text{ t ha}^{-1}$ (table 3). The production of onion, tomato and pepper suggests the presence of suitable markets to supply and hence an income-generating component in these cases. Increases in productivity through the promotion of farmer innovation were clearly evident with increases in the yield of cassava from 0.8 to 10.0 t ha^{-1} (table 3).

Table 3. Mean yields and range for before and after the development of the Bright Spots for returns from 16 cases in Africa. Values in parentheses are the standard errors of the mean (SE).

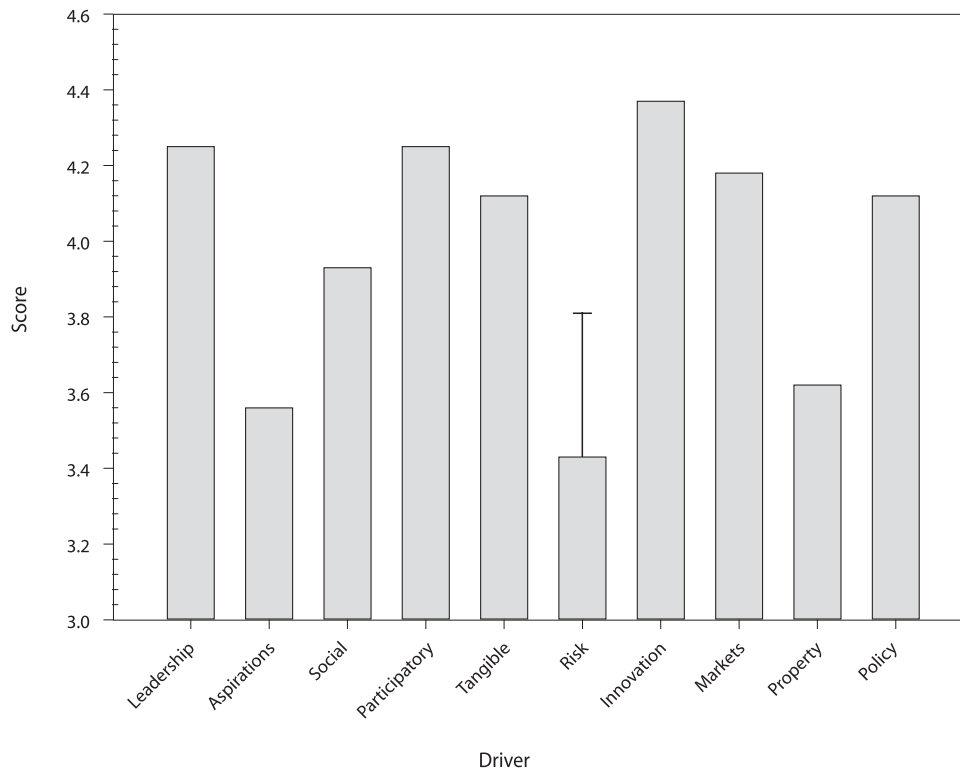
| Crop | Number of observations | Yield before (t ha ⁻¹) | Yield after (t ha ⁻¹) | Relative increase (1.00 indicates no change) |
|-----------|------------------------|------------------------------------|-----------------------------------|--|
| Maize | 11 | 0.58 (±0.06) Range: 0.20 – 0.87 | 1.7 (±0.26) Range: 0.35 – 4.0 | 3.16 (±0.56) Range: 1.53 – 8.00 |
| Onion | 6 | 6.71 (±1.77) Range: 0.7 – 10.0 | 9.86 (±2.36) Range: 1.2 – 15 | 1.64 (±0.17) Range: 1.33 – 2.50 |
| Bean | 1 | 0.4 | 1.8 | 4.50 |
| Tomato | 2 | 10.9 Range: 1.99 – 20.0 | 15.75 Range: 2.5 – 29.0 | 1.35 Range: 1.25 – 1.45 |
| Cassava | 1 | 0.8 | 10 | 12.50 |
| Sunflower | 1 | 0.5 | 1.8 | 3.60 |
| Soybean | 1 | 0.4 | 1.0 | 2.50 |
| Groundnut | 1 | 0.9 | 1.4 | 1.55 |
| Pepper | 1 | 0.7 | 0.9 | 1.28 |

The total number of households/farmers benefiting from the development of these selected Bright Spot activities was 6,881 (range: 75 – 2,000) with a positive impact on 18,440 hectares (range: 50 – 8,000 ha). Clearly, there has been a wide range of impacts at the household and area levels that are reflected in the development of smallholder irrigation systems and extensive holistic approaches to land and water development. As expected in the development of smallholder irrigation projects there is a significant investment in infrastructure and the rehabilitation of derelict water conveyance structures. In addition, several projects promoted the establishment of trees within the project area with an estimated total number established exceeding 1 million. All of these activities would have had a positive impact on environmental goods and services associated with the development.

Drivers Associated with the Development of Bright Spots

Using data collected on the drivers associated with the development of Bright Spots (Noble et al. 2004), an analysis of these drivers indicated that innovation, leadership and participation were key elements in the development of these successes (figure 4). Risk, aspirations and property rights all ranked low as a priority in the development of these successes. In the case of risk having the lowest ranking, this may in part be associated with the presence of small irrigation projects that would by their very nature reduce risk associated with rain-fed agriculture. The fact that property rights were not deemed to be a significant factor in the development of these Bright Spots was to be expected as all respondents occupied their own land. There was no significant interaction between drivers at the initiation of the project and for their continuance suggesting the importance of the aforementioned drivers after withdrawal of the implementing team.

Figure 4. Scores associated with individual drivers that contribute to the development of Bright Spots in selected cases from Africa (n=16). Vertical bar represents the least significant difference ($LSD_{0.05}$) between treatment means.



The Cost of Developing Bright Spots

In the questionnaire returns, a total of 15 respondents indicated the breakdown of funds expended during the course of the project (table 4). Funds committed to the development of individual projects ranged from \$45,000 in the case of Sutaa-Nuntaa Rural Development Program in Ghana that focuses on the empowerment of communities to become food-secure with a specific focus on women to \$8,877,675 in a small-scale irrigation project (150 ha) in Ethiopia. The largest source of funds associated with the development of these projects was under “others” that included predominantly direct foreign government funding. This was followed by significant funds from NGOs (table 4). The mean investment on a per hectare basis directly impacted upon by the project was estimated to be \$366 ha⁻¹.

In an exhaustive analysis, the average cost of successful investments in formal irrigation schemes in sub-Saharan Africa in the past decades has been found to be as high as \$5700 ha⁻¹ with small schemes being even more expensive than large ones (Inocencio et al. 2005). Lower contributions from private funds for these schemes than for Bright Spots may be one reason for that, but the tenfold difference is very large indeed. We conclude that it is quite likely the informal, bottom-up approach to development leading to Bright Spots is a much more effective use of public funding than development of formal irrigation schemes.

Table 4. Funds expended from different sources in the development of selected Bright Spot projects in Africa.

| Project No. | Financial sources (\$) | | | | | | Total |
|-------------|------------------------|---------------|---------------------|-----------|-----------|-----------|-----------|
| | Bilateral | International | National government | Community | NGO | Other | |
| AF300 | | | 161,860 | 46,359 | 231,802 | | 440,021 |
| AF301 | | | 60,134 | 72,559 | 311,188 | | 443,881 |
| AF302 | | | 87,133 | 31,769 | 198,880 | | 317,782 |
| AF303 | | | 107,498 | 78,224 | 458,621 | | 644,343 |
| AF304 | | | | | | 877,675 | 877,675 |
| AF305 | | | | | | 482,050 | 452,050 |
| AF306 | | | | | | 245,443 | 245,443 |
| AF307 | | | | | | 382,085 | 382,085 |
| AF308 | | | | | | 496,953 | 496,953 |
| AF309 | | 45,000 | | | | | 45,000 |
| AF311 | 25,000 | | | | 7,000 | 800,000 | 832,000 |
| AF312 | 4,400 | | | | | 252,000 | 256,400 |
| AF313 | 150,000 | | 20,000 | | 10,000 | 5,000 | 185,000 |
| AF314 | 250,000 | | | 2,000 | | | 252,000 |
| AF316 | | | | | 226,901 | 82,179 | 309,080 |
| Total | 429,400 | 45,000 | 436,625 | 323,090 | 1,434,392 | 3,541,206 | 6,209,713 |

DISCUSSION AND CONCLUSIONS

The results from this study suggest that in Africa there are numerous examples of Bright Spots where livelihoods and the environment have been positively impacted upon through innovation and adoption of improved and sustainable farming practices. They have resulted in significant impacts on individuals and communities that go beyond the initial adopters as evidenced by the number of hectares and individuals affected. There is clear evidence that these Bright Spots are able to sustain themselves beyond the implementation stage. This gives us cause for cautious optimism in that development activities that have had as their focus individuals and communities are achieving success with respect to securing livelihoods and enhancing the environment.

In the majority of cases, the development of a Bright Spot is contingent on an external priming agent. Invariably, this external driver facilitates the development of the Bright Spots through financial and nonfinancial contributions. In the former case, financial contributions may be significant in their development. In this respect, the total amount invested in the 16 cases amounted to \$6.2 million representing a net investment of \$366 ha⁻¹. In a similar assessment of selected development projects in Latin America it was estimated that the net investment was substantially higher at \$714 ha⁻¹ (Noble et al. 2004). If further development and replication of Bright Spots are contingent on significant financial and nonfinancial resources, the ability to replicate and upscale these successes will inevitably be restricted, questioning the concept of growing these successes. It is suggested that this may, in fact, be the greatest limiting factor restricting reproducibility. Without continued and sustained increased investments in development projects along with innovation at a scale possibly commensurate with that of Latin America, the probability of scaling up these and other Bright Spots in Africa is remote.

We have identified key drivers for the development of Bright Spots (Noble et al. 2004) although there should be a degree of caution associated with their interpretation due to the limited number of cases. What has been identified in a global assessment of Bright Spots is that they fall into three broad categories.

First, there are those few cases that can be termed “spontaneously” driven Bright Spots, these having the attributes of growing from within without incentives or external support. Several examples of such “spontaneously” driven Bright Spots can be found in Africa and have been documented as farmer innovations (Mutunga and Critchley 2001; Critchley et al. 1999). These Bright Spots often develop through indigenous knowledge that has their roots in ancient traditions (Chambers et al. 1989; Gupta 1998). In various regions of Africa there have been very positive experiences with identification of, and working with, “local innovators” (Critchley et al. 1999; Reij and Waters-Bayer 2001), suggesting that these “spontaneously” driven Bright Spots can become the vehicle for change and upscaling. The logic of such an approach is that if a local innovation “works” then by definition it is appropriate for the set of conditions that prevail. In their analysis of “local innovators” Critchley and Brommer (2003) have discussed what drives people to break away from convention and innovate. They concluded that:

- People innovate as they search for a way out of poverty. Clearly, innovation is not undertaken due to curiosity. The innovators are poor people who invest in their talents to derive income to satisfy basic needs.
- Innovations are often multifaceted. It is rare to find just a single technology being tested in isolation; it is normally found that a basket of ideas are being tried at the same time.

What is important to realize is that these “local innovators” are a small minority within the overall population distribution. They are often termed as sitting on the fringes of society, eccentric, and usually do not conform to the norms of the local community. This may in part, restrict the ability to replicate these successes at the wider community. This has certainly been acknowledged and steps to address these barriers have been initiated through the establishment of Farmer Field Schools.

The second category can be termed technological-driven Bright Spots. Invariably, the benefits that accrue due to the adoption of a technology or innovation to existing practices are to the individual and are independent of the wider community. Globally, there are numerous examples of this category that have had a significant impact on livelihoods and food security. One of the most outstanding examples of this category of Bright Spots is the implementation of zero tillage (ZT) in Brazil. From the adoption of ZT by a single farmer in 1972 on 500 hectares, this practice of land preparation has spread to over 9 million hectares to date. It is notable that the expansion of ZT has most effectively been achieved by farmer-to-farmer extension, through affiliated networks of “Friends of the Land Clubs” and State Extension services of Brazil (Shaxson 1998). The success of the ZT revolution in Brazil has been largely due to the close partnerships that have developed between farmers, researchers and advisers so as to unlock the latent skills and enthusiasms of each party. Invariably, this has resulted in innovation and adaptation by all parties concerned. In contrast to their counterparts in North America and Europe who adopted ZT practices in order to reduce fuel consumption and labor costs associated with land preparation, Brazilian farmers in the State of Paraná adopted ZT to counteract soil erosion and its associated effects of contamination of water sources due to the extensive use of herbicides and pesticides (Ralisch et al. 2004). A key factor favoring the adoption of ZT by smallholder farmers was the development of animal traction machines

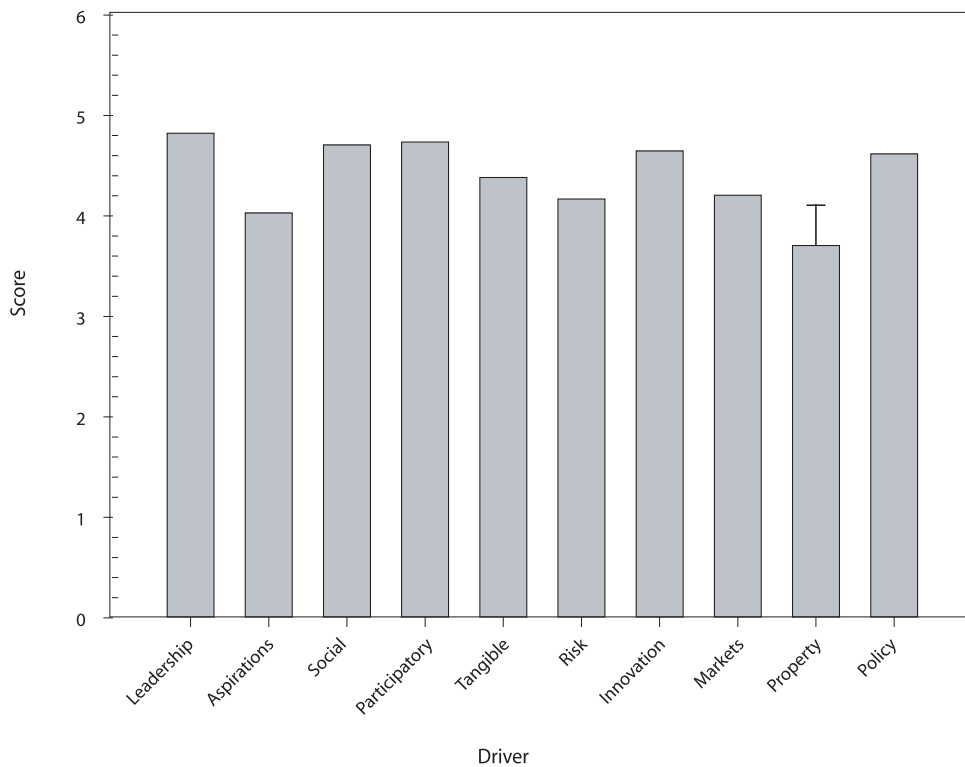
for planting, fertilization and herbicide application. Clearly, there were short-term tangible benefits that accrued to the individual due to the adoption of ZT. It should also be noted that changes in government policy facilitated the scaling up of ZT adoption. Similarly, individual farmers in the Punjab, India, identified quick and tangible outcomes and a low risk of failure to be the most important criteria in the adoption of sustainable agricultural practices (Noble et al. 2004).

The third broad category of Bright Spots identified comprises those that are community based. These include the small-scale irrigation schemes as discussed previously and successful watershed programs of India, Africa and Latin America. Watershed development programs are some of the most complex systems to effect change, in that watershed boundaries rarely correspond to human-defined boundaries. In addition, these projects often distribute costs and benefits unevenly, with costs being disproportionately leveraged on upstream users, typically among poorer sectors of the community, and benefits being realized disproportionately downstream, where irrigation is concentrated and the wealthiest farmers own most of the land (Kerr et al. 2000). In a study of factors influencing the success or failure of implemented watershed projects, Kerr et al. (2000) posed the hypotheses that participatory approaches, which devote more attention to social organizations yield a superior project impact, and that favorable economic conditions and adequate infrastructure also support better natural resource management and higher productivity. The findings of this empirical study lend support to the hypothesis that participatory projects perform better than their more technocratic, top-down counterparts and that a combination of participation and sound technical input may perform the best. Clearly, it is evident from their analyses of watershed projects in India that a key driver in their development has been institutional development. In this respect, the development of a community-based organizational structure with full participation by all elements of the community was critical, and the most successful projects were those in which there was strong collaboration between government departments and NGOs.

Watershed-based interventions have a clear focus on mobilizing communities and groups that invariably have a strong “community” orientation. An analysis of the drivers associated with the watershed-based cases from India and Latin America (Noble et al. 2004) indicated that property rights had the lowest ranking followed by risk and aspirations for change (figure 5). As the focus of a watershed-based program is on effecting positive change with equitable impacts on all members of the community, the influence of individual property rights as a driver for change would diminish. Similarly, risk would effectively rank low as it could be perceived that risk is borne by the community as a whole and not by a single individual. However, the low ranking of aspirations is an interesting outcome. It is argued that aspirations as a driver for change may effectively be taken as a “given” attribute that is essential for the process of Bright-Spot development to begin, particularly in those cases where community involvement is important. Leadership, participation, and social and innovation drivers all ranked high as key attributes that facilitated the development of watershed-based Bright Spots that have a strong community focus (figure 5). It is important to note that in community-based Bright Spots “external” support is critical. External support may take the form of the government and NGOs playing a significant supportive role with associated financial investments. This may in itself be a limiting factor affecting replication in both extent and impact at the household level.

Whilst the analysis of these Bright Spots and the role of selected drivers (Noble et al. 2004) discriminate between individual elements with respect to their importance, it does not allow for an assessment of the interaction between these elements and their importance at different times or stages in the development process. It is certainly appreciated that no single driver or group of drivers contribute to the development of a Bright Spot but rather that a synchronized interplay between these elements occurs to affect the desired outcome. The analysis of drivers assists us to understand

Figure 5. Scores associated with individual drivers that contribute to the development of Bright Spots associated with watershed development (n=17). Vertical bar represents the least significant difference ($LSD_{0.05}$) between treatment means (Noble et al. 2004).



the key elements contributing to the development of Bright Spots and sheds some insight into the processes that result in developing specific Bright Spots.

The reason that these cases/projects excel are numerous and varied and may include factors such as financial support at critical stages in their development, cultural acceptability and political will among others. What is common to all these cases is the focus on motivation and resolve of those who champion sustainable development. In this respect, these champions may be individuals intimately involved in the development of the Bright Spots as demonstrated in the box articles presented in chapter 6 (“Examples”), or external agents, namely donors, NGOs and government organizations as evidenced in several community-based watershed projects discussed by Noble et al. (2004). Hence, this could be viewed as an essential element in the development of Bright Spots.

There is a need for guidelines in identifying the typology of sustainable Bright Spots. In this respect, the current study confirms the importance of key criteria that constitute a Bright Spot as outlined by Kitevu et al. (2002) and offers the following guidelines in their identification. The Bright Spot should contribute to the following:

- Increasing potential income and result in the creation of employment for the wider community.
- Having the attributes of efficient resource utilization.
- Building of capacity within the community or individuals that enables effective technology transfer.

- Improved health of the community and/or environmental quality.
- Improvements in time usage by individuals.

In addition a Bright Spot should:

- Involve appropriate and sustainable technologies. Often, this requires the adoption of new or innovative technologies that need to have quick and tangible benefits with a low risk of failure.
- Employ local skills and resources.
- Guarantee long-term benefits associated with the communities' involvement.

Whilst the aforementioned identifies criteria that constitute a Bright Spot, the question arises as to what key elements are required in order to create a Bright Spot that has a positive impact on *livelihoods*. In this respect, Carney (1998) describes a livelihood as being sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base. In this respect, livelihoods rely for their success on the value of services flowing from the total stock of natural, social, human, physical and financial “capital” (Coleman 1990; Costanza et al. 1997; Daily 1997; Carney 1998; Pretty 1998; Scoones 1998; Pretty and Ward 2001; Krishna 2002). Thus a sustainable livelihood means better access to renewable assets and better capacity to derive value from them. Consequently, the basic premise is that sustainable systems accumulate stocks of the five capitals, thereby increasing the per capita endowments of all forms of capital over time. In contrast, unsustainable systems deplete or run down these various forms, spending assets as if they were income, so leaving less for future generations (Pretty 2003). This is invariably the case in target communities with respect to development projects and hence the concepts embedded in the five capitals becoming critical with respect to effecting change in their livelihoods.

In an effort to define the key drivers that assist in the development of Bright Spots we have drawn upon an analysis of global Bright Spots that include those from Africa (Noble et al. 2004). In the study by Noble et al. (2004) they identified three basic types of Bright Spots, namely “spontaneous,” “community-based,” and “technical-based” Bright Spots. With respect to the “spontaneous” Bright Spots, their developments are based on a small group of unique and diverse individuals. As these are “spontaneous” there is no clear pathway in their development other than knowledge/information and inventiveness on the part of the individual. Contrasting this, in the case of “technical-” and “community-based” Bright Spots we have attempted to rank key drivers that influence the development of Bright Spots based on the survey by Noble et al. (2004) (table 5).

In the analysis of the drivers associated with “community-based” Bright Spots, a total of 33 case studies that included watershed and small irrigation development projects were deemed to fall into this category. The sample included projects from Africa, India and Latin America. As discussed previously, in order for a Bright Spot to develop, the process of self-actualization needs to have been achieved. This results in the willingness of the individuals or community to aspire for change. Hence it is assumed that “aspiration” for change is a prerequisite in the development of all Bright Spots. Often, the driving force behind this process is external. We have undertaken an analysis of variance of scores ascribed to the individual drivers as described in the questionnaire (chapter 6).

Table 5. Key drivers and their importance in the development of “community-” and “technical-based” Bright Spots. Values in parentheses are the scores associated with each driver.

| Type of Bright Spot | Importance in the development of a Bright Spot | |
|---|---|---|
| | High priority | Lower priority |
| Community-based intervention. Number of observations = 33. | Leadership (4.52) Quick and tangible outcomes (4.42) Supportive policy (4.39) Social capital (4.36) Participatory approach (4.33) Innovation and appropriate technology (4.33) | Low risk of failure (4.04) Markets (3.91) Property rights (3.69) |
| LSD _(0.05) | 0.40 | |
| Technology-based intervention. Number of observations = 204. | Quick and tangible outcomes (4.93) Innovation and appropriate technology (4.92) Participatory approach (4.55) Leadership (4.54) Supportive policy (4.53) Markets (4.50) | Low risk of failure (4.24) Social capital (1.26) Property rights (1.11) |
| LSD _(0.05) | 0.13 | |

In the analysis of “community-based” Bright Spots, the six drivers identified as a high priority in their development were: leadership; quick and tangible outcomes; supportive policy; social capital; a participatory approach with respect to the implementation of the project; and innovation and appropriate technology (table 5). Low risk of failure, the development of markets and property rights were deemed to be of a lower priority. Whilst we should treat this analysis with caution, based on the limited sample number (n=33), it does give an indication of the relative importance of drivers in the development of a “community-based” Bright Spot. It would appear from these results that in order to effect a successful Bright Spot, it is vital that implementing agencies, be they government organizations, NGOs or the private sector, need to make a significant investment into social and humans capital assets.

With respect to “technical-based” Bright Spots, we have drawn upon survey results from India where a range of sustainable farming practices were introduced to individuals or farmer groups in Tamil Nadu and the Punjab (Noble et al. 2004). These practices included the adoption of organic-based farming systems, introduction of the System of Rice Intensification, integrated nutrient management, integrated pest-management systems, and improved weed management. In general, with the development of a technical-based Bright Spot the benefactor is predominantly the individual and involves the adoption of a new technology or improvements in their current farming practices. In analyzing the 204 individual cases quick and tangible outcomes are an important driver in the adoption of new innovations and appropriate technologies (table 5). This is followed by a participatory approach in implementing the technology; strong leadership by the individual or group adopting the technology; supportive policy; and markets (table 5). It is interesting to note that risk was given a significantly ($p < 0.05$) lower score than the aforementioned drivers. This could be explained on the basis that the adoption of a new technology needs to have quick and tangible outcomes and hence risk could be viewed to be low. Similarly, social capital and property rights were viewed as having a low priority (table 5).

CONCLUSIONS

Bright-Spot communities in which food security, livelihoods and the environment are significantly improved can be found in many countries and ecological regions. The impact in Africa can be seen on about 1 percent of its land area and 0.5 percent of its population. Bright Spots will develop when the external conditions are conducive, and when there are internal drivers. Among these drivers, empowered communities are sometimes the key element, technology in other cases, but spontaneous developments of Bright Spots were observed where strong individuals played a key role. It is argued that understanding the roles of “drivers” and “conditions” can accelerate significantly the upscaling of Bright Spots. In addition, we conclude that the benefits associated with the development of Bright Spots are largest for those with the lowest yields. It appears, therefore, that the promoting of Bright Spots may well benefit the poorest smallholders more than those already slightly better-off. This “self-selection” aspect is very important for rural development targeting of the poorest.

It is evident from the analysis of these limited cases that a key element in the development of Bright Spots is “new knowledge” and innovation that result in change. By “new knowledge” we interpret this broadly, as knowledge that has not as yet been used by the community. Both of these elements are important attributes in the development of all Bright Spots. Innovation by its very nature involves new knowledge and insight.

Finally, it is clearly evident from this analysis that fundamental to the development and expansion of Bright Spots is knowledge (i.e., an investment in human capital). This implies that there is a receptive audience that is able to assimilate and utilize new information in a manner that effects positive changes. Far too often, this is taken as a given, when in reality there are serious flaws in the level of receptiveness of the target audience that precludes effective assimilation and utilization of new knowledge. This is a challenge that will continue to influence the success of development-based projects. It could be argued that there is the danger of not going far enough—of being satisfied with any degree of partial progress, resulting in, as Ostrom (1998) puts it: “*creating citizens rather than entrepreneurial citizens reduces the capacity of citizens to produce capital.*” The costs of development assistance will also inevitably increase—it is not costless to build human capital; however, the rewards are infinite.

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Chapter 3

Bright Spots on Technology-Driven Change in Smallholder Irrigation: Case Studies from Kenya

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ABSTRACT

The New Partnership for Africa's Development (NEPAD) recognizes agriculture as one of five sectoral priority areas for development in Africa. In sub-Saharan Africa, agricultural production lags behind population growth, and if this trend continues at the present rate, sub-Saharan Africa will not meet the Millennium Development Goals on poverty and hunger by 2015 (NEPAD 2003). In this respect, FAO has indicated that 75 percent of the agricultural growth required in sub-Saharan Africa by 2030 will have to come from intensification rather than from extensification of agriculture. To achieve this, technologies that tackle water management, tools, information, inputs, value addition and marketing form an important component. Successful adoption of these technologies can be found in isolated localities all over sub-Saharan Africa, and their identification and verification provide Bright Spots from which others can learn from well-tested practical experiences. This chapter presents five case studies as Bright Spots from rural Kenya engaged in supplemental or full-scale irrigated agriculture, in which the communities have succeeded in achieving food security and poverty reduction, through ingenious technological community-scale innovations. Each Bright Spot is unique in terms of the innovation and lesson learnt. Moreover, farmers have achieved positive impacts of their innovations within a relatively short span of time, showing these to be "quick wins."

Although each of these Bright Spots has a different innovation and focus, certain common denominators emerge associated with the successes in almost all cases. Twelve of these are: i) new knowledge, ii) training, iii) educational levels, iv) investment of financial capital, v) cost sharing and loans, vi) markets, vii) facilitation, viii) involving government institutions, ix) infrastructure (roads, mobile phones), x) youth, xi) land tenure, and xii) water availability.

However, even with these successes, farmers engaged in irrigated agriculture still face many problems which can be grouped into three major issues: i) marketing, ii) administrative issues, and iii) interventions to deal with water scarcity/management.

In general, the benefits of Bright Spots had been achieved within 2 to 3 years. Lessons learnt include; identification of niche products that require minimal production inputs, value addition (processing, packaging) to improve portability and increase market value of produce, proper agronomic management, targeted marketing, developing strong water user organizations with stakeholders from within and beyond the irrigation scheme, rainwater harvesting, storage and its utilization for supplemental irrigation of high-value crops and resource mobilization. Thus, it can be concluded that within a relatively short period of time, poverty and food insecurity at community level can be eradicated through technological innovations associated with smallholder supplemental or full-scale irrigated agriculture, where an enabling environment has been facilitated, regardless of how poor they were to begin with.

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INTRODUCTION

Agriculture is the most important rural enterprise in sub-Saharan Africa, accounting for some 67 percent of employment (World Bank 2003). Yet agriculture has continued to perform poorly, dogged by low productivity, technologies geared towards subsistence farming, poor prices of agricultural products and weak marketing infrastructure. With about 80 percent of the region's poor people living in rural areas, agriculture must be improved through overcoming natural limitations, such as poor soil fertility, inadequacy in rainfall and means of production that commercialize the agriculture sector. In this respect, smallholder agriculture has been increasingly identified as a major cause of, and potential solution for, poverty reduction and economic growth (DFID 2002). The expansion and improvements in irrigated agriculture form an important component of this. Although the subregion of sub-Saharan Africa has an irrigation potential of about 42 million hectares only about 5.6 million hectares or 5 percent of the cultivated area is irrigated. Moreover, even with the current poor performance, agriculture is the largest user of water in Africa, accounting for about 85 percent of the total water use (World Bank 2000; FAO 1995).

The African Water Vision for 2025 and Framework for Action envisage that to meet the food gap in Africa, irrigated area will have to double from the current estimate of 12 million hectares to 24 million, and water productivity from rain-fed and irrigated agriculture will have to increase by 60 percent to meet the urgent basic needs (UN-Water Africa 2003). To meet the Millennium Development Goals on Poverty and Hunger reduction, it will require developments in water for agriculture by at least 10 percent of the potential, targeting improvements by 25 percent in water productivity of irrigated agriculture by the year 2015 (Donkor 2003). To achieve this, agricultural water management will, of necessity, have to play a leading role in the face of climatic uncertainty inherent in rain-fed agriculture, which currently accounts for 95 percent of the total land under production. Adaptable technologies (hardware, information, inputs, marketing) form an integral part of the main drivers of development. Whereas there is ample information on what has gone wrong with African agriculture and reports of success cases are few, yet much has changed within Africa in the last 40 years. Research in Kenya has shown that there are isolated technological innovations in which communities have overcome huge obstacles to make smallholder irrigated agriculture profitable, thereby improving food security and creating wealth, but these need scaling up to national levels.

Current estimates indicate that Kenya has a potential for irrigating 540,000 hectares. As at 1999, there was only 1.5 percent of cultivated area (about 82,000 ha) under irrigation, which was about 14 percent of the potentially irrigable area. Private farmers cultivate 40 percent of irrigated land for horticulture and export crops while government-managed schemes cultivate 42 percent (Republic of Kenya 2003). About 200,000 smallholder farmers irrigate 56,600 hectares of land constituting only 17 percent of the available potential (Mati 2002). These farmers produce the bulk of the local horticultural crops consumed in Kenya as well as some of the export horticultural crops and a substantial amount of dairy products. In the medium and high potential areas, supplementary irrigation, based on surface flows, has been instrumental in increasing productivity of high-value crops. Herdjk et al. (1990) observed that there is a need to define the type, extent and geographical distribution of services that irrigation enterprises need, and which of these services could be rendered by the public or by the private sector. Even then, the gross value of agricultural production attributed to large irrigation schemes in Kenya was about KSh1.4 billion in 2000 (Central Bureau of Statistics 2001), but that from smallholder farms remains largely unknown.

It has been proposed that availing water for irrigation using affordable small-scale individualized technologies can make a dramatic contribution to household food security and potentially enhance the possibilities for farmers to jump over the poverty line (Sally et al. 2003). One relatively quick way of achieving this is to adopt technological innovations which have proven successful in other parts of Africa. Such interventions can be at individual level, national level or community scale known as “Bright Spots.” A Bright Spot is defined as a community or group of individuals that achieve higher food and environmental security, through improvements in (among others) land and water management. Bright Spots are potentially sustainable and levels of natural resource capital are above ecological and economic thresholds in contrast to unimproved situations (Haggblade 2005). In this study, we examine five Bright Spots on smallholder irrigated agriculture in Kenya, with a view to understanding their key drivers to develop strategies for upscaling and replication.

METHODOLOGY

The selection of Bright Spots on smallholder agricultural water management (supplemental or full-scale irrigation) started with meetings with key stakeholders in irrigated agriculture, including government officials from the Ministry of Water and Irrigation (MoW&I), NGOs, public and private sectors, as well as a review of literature. Based on these, five smallholder irrigation schemes, each having innovative technological interventions, were identified. These were:

- i) Ng’uuru Gakirwe Water Project, Tharaka district
- ii) Mukuria-Kyambogo Irrigation Scheme, Tri-Hills Horticultural Self-Help Group, and Homegrown Ltd. all of Timau Division, Meru Central district
- iii) Lare Water Harvesting project, Lare Division, Nakuru district
- iv) Isiolo River Water Users Association (IRWUA), Isiolo district
- v) Mitunguu Irrigation Scheme, Meru Central district

Each irrigation scheme (Bright Spot) was visited and evaluated, based on its physical condition, while focusing on its impact on food security and poverty reduction. Meetings and focused group discussions were held with farmers, extension officials, local leaders and government officials. Information was gathered on origins of the innovation, crops grown, marketing and infrastructure, cost/benefit analyses, problems faced, and management of group resources, e.g., water, credit, membership and community perception of success or otherwise. It was found that each of these Bright Spots was unique and yet quite replicable. Details of each Bright Spot are presented in individual case studies that follow.

KENYAN BRIGHT SPOTS IN IRRIGATED AGRICULTURE

Case Study 1: The Ng'uuru Gakirwe Water Project

Location: Tunyai, South Tharaka Division, Tharaka district.

Innovation: Production of high-value (organic) herbs, accompanied by processing, packaging and sale in niches and export markets abroad.

Origins of the Ng'uuru Gakirwe Water Project

Tharaka district is classified as arid and semiarid lands (ASALs) and, according to the Farm Management Handbook of Kenya (Jaetzold and Schmidt 1983), the district can only accommodate dryland crops such as millet, sorghum and cowpea, and livestock keeping. However, with annual rainfall rarely exceeding 600 mm (Sombroek et al. 1982), even these crops suffer recurrent moisture stress, leading to crop failure due to poor rainfall distribution. The district is therefore one constantly in need of food relief. Moreover, poverty prevalence is very high, with about 60 percent of the population living below the poverty line (Republic of Kenya 2004). The Ng'uuru Gakirwe Water Project therefore started out with poor disadvantaged members.

This project is a smallholder, piped, gravity-fed scheme, drawing water from the Kithinu river, a tributary of the Mutonga river. The original plan was to supply people with domestic water, but they started irrigating with it, necessitating the need to expand the intake and expansion of the scheme to allow irrigation. The scheme was developed in three phases, starting in 1988 with Phase 1, which had 135 connections (i.e., 135 farm units). Phase 2 was developed during 1992-95, with 135 connections and Phase 3 during 1996-2000 with 170 connections. The project was provided as a loan for which the farmers pay KSh1,250 (about \$16) per year as water charges. The flow discharge is about $0.18 \text{ m}^3\text{s}^{-1}$ (or 0.4 ls^{-1} per farmer) available 24 hours a day. Irrigation is by sprinkler and each farmer is expected to irrigate up to 1 hectare. The scheme covers an area of 60 km², accommodating a total of 430 farmers and has its own processing and packaging factory. The farmers have formed a company, Meru Herbs, which handles the factory as well as marketing.

Production of Organic Herbs for Niche Markets

The most important crops grown at Ng'uuru Gakirwe are chamomile, carcade and lemongrass. These three herbs are grown organically and sold to the factory for processing, packaging and export to the EU (mostly Italy, Belgium and Germany). At the time of this study (August 2004), only 43 farmers were certified as organic farmers. To be certified, the prospective farmer undergoes a training and observation period for 3 years. During this time, he/she must set aside a section of the farm to be used for organic farming, and follow the instructions of the technical officer regarding the use of inputs which involve the use of manure and organic pest-control methods (no fertilizers, no chemical pesticides). Once the farmer is certified, he/she sells the fresh herbs, harvested as flowers in the case of chamomile and carcade, to the factory. Training is an important component of the project as farmers come from a background of rain-fed cereal crops with little experience in irrigation or exotic herbs. In addition, regular monitoring and random sampling of soils and plant parts are done, and at least twice a year, a European inspector also visits the scheme and collects samples from farms selected at random. Crop rotations with ordinary food crops such as maize or millet are encouraged, but even the rotation crop must be grown organically.

Farmers who are not certified as organic may grow any combination of local vegetables, such as kale and tomato, or Asian and export vegetables like dudhi, karela, okra, french bean, brinjal and chili. These crops are usually sold through middlemen for local and overseas markets. Farmers are unhappy with this marketing system, which is de-linked from Meru Herbs, because of exploitation by the middlemen. For this reason, many farmers who are not organically certified grow herbs, which they sell to Meru Herbs, but these are marketed locally. In addition, farmers grow fruits like mango, banana and papaya which are also sold to Meru Herbs for making of various types of additive-free jams exported to the EU and Japan. The biggest problem was that Meru Herbs sometimes did not buy all the produce due to the limited market abroad.

Processing, Packaging and Marketing of the Herbs

Meru Herbs Company is the commercial arm of the Ng'uuru Gakirwe Water Project and is located in the project area, with the support of the Diocese of Meru. However, Meru Herbs processes and exports only a small percentage of the produce by the farmers. The company hires workers (mostly women) for the factory and operates almost independently of the Water Project. But farmers get seeds and inputs on credit from the company. Meru Herbs has two factories, the major one handles the herbs (carcade, chamomile and lemongrass) while the other makes jams. Once farmers deliver their herbs they are sorted, graded, weighed and, in the case of carcade, they are manually shelled to remove seeds, then dried for one week—chamomile in the shade and carcade in the sun. If it rains, there is an electric drier available. Once dry, the florets are allowed to stay overnight in trays, then ground, graded again and packed. The packaging is beautifully done, and produces a variety of sole types and combinations of herbs for various uses. For instance, there is plain chamomile, carcade and lemongrass, carcade mixed with lemongrass, tea and lemongrass, chamomile in packets of 20 tea-bag sizes or loose carcade. These are further packaged in printed boxes for export. In the jam factory, they make papaya, carcade and mango jams. Fruits for the jam factory are not organic and therefore the factory accepts all fruits, even those from outside the scheme. The jams are made without additives and are therefore sold to niche markets in Japan and the EU and also in upmarket areas of Nairobi.

Impacts on Food Security and Poverty Reduction (Ng'uuru Gakirwe)

There are many indicators of the impacts of the Ng'uuru Gakirwe Water Project on reducing poverty and improving food security. For instance, during the long rains in March-May 2004 this was visible because the long rains were inadequate, resulting in crop failure in neighboring farms that had no access to irrigation; but farms within the scheme had healthy crop stands. Moreover, interviews with farmers in the scheme revealed that they were happy with the scheme and their lives had improved tremendously since they started irrigated agriculture. One good example is Ms. Lucy Gateria. She used to be a very poor farmer before the irrigation water reached her farm in 2000. Now with irrigation, her favorite cash crops are carcade and chamomile. She harvests at least 80 kg/month of chamomile (note that chamomile is a very light flower) which fetches KSh80/kg (\$1/kg), and 2,000 kg of carcade at KSh7/kg (\$0.09/kg). She earns at least KSh20,000-30,000 (\$250-375) per month. And this is only from the two major cash crops. In addition, she also grows other crops like banana, local vegetables, sugarcane for food and the excess for sale. In a place like Tharaka where famine relief is a normal occurrence, this kind of income is considered quite high. After all, it is more than that of a schoolteacher, nurse or secretary in a government office. She

also pays the annual fees of KSh1,600 (\$20) for the water, and indicated that it is a worthwhile expense. There are also adopter farmers, like Joseph and Monica Mutembei, who are in their first year under observation hoping to become certified organic farmers. Young and enthusiastic, the couple planted several beds of chamomile and already they have been harvesting about 30 kg/week, and also 80 kg/week of carcade. The rate of adoption is so high that Meru Herbs cannot cope with the supply from farmers. In addition, there is great pressure from the community to expand the scheme, but water availability is a limiting factor.

Lessons from the Ng'uuru Gakirwe Water Project

During the Presidential Level seminar held in Addis Ababa, Ethiopia in July 2004 to chart the way forward for implementation of the UN Hunger Millennium Development Goals for sub-Saharan Africa, one recommendation for the way forward included among others; *water management (irrigation), soil fertility management, agro-processing, marketing and commitment for decisive action to transform agriculture from subsistence to commercial farming*. Thus the Ng'uuru Gakirwe Water Project has fulfilled these interventions, and already positive impacts are being experienced. This success can be attributed to availability of irrigation water, reliable and stable markets, value adding, introduction of products that meet niche market demands and a willing community. As eating habits of people in Europe and elsewhere become sophisticated, they are willing to pay premium prices for organically grown and exotic products. Recognition of which exotic products can be grown organically with lowest risks of damage so that farmers achieve the necessary export quality at least cost is crucial for success. This project seems to have achieved that, including the fact that post-harvest handling does not require any inputs and therefore, the farmers can easily take over the running of the factory. As with all projects dealing with the very poor, it is sometimes necessary to inject some seed funding to jump-start development, and the cost-sharing element in repaying the loan at rates affordable to farmers also gives them a sense of responsibility. Training of the farmers and regular supervision have enabled them to learn how to grow exotic products and maintain high-quality standards. There are of course problems of water shortages, mostly because farmers want to irrigate larger fields, as well as the old problems of marketing of crops through middlemen. However, Ng'uuru Gakirwe Water Project offers an excellent example of where a disadvantaged community has broken the poverty trap and closed the food gap, through innovative choice of crop, training, management, agro-processing and marketing in niche markets.

Case Study 2: Mukuria-Kyambogo Irrigation Scheme, Tri-Hills Horticultural S.H.G. & Homegrown Ltd.

Location: Timau Division, Meru Central district.

Innovation: Partnerships between large commercial farms and smallholder outgrowers enabling smallholder farmers to fulfill the EUREP-GAP protocols and access EU fresh-produce markets.

Background to the Mukuria-Kyambogo Group Irrigation Scheme

The Mukuria-Kyambogo Group Irrigation Scheme is a gravity-fed, piped sprinkler scheme drawing water from the Teleswani river on the upper lee slopes of Mt. Kenya. The scheme was started in 1994 by a group of 15 farmers with a loan. They had first built the intake using their own contributions and the loan was needed to buy materials such as pipes, sprinklers and gate valves, while they used their own labor. The loan was provided in kind, i.e., the materials were bought and delivered, while technical expertise was provided by the Ministry of Agriculture. Each of the 15 farmers paid back the loan at KSh1,000 (about \$16) per month for 48 months when all the members completed repaying the loan. At the time, they were growing local vegetables like carrot, cabbage and potato. As of 2004, membership was still restricted to the original 15 farmers, a condition attributed to limited water supply and therefore little room for expansion. Land tenure is individual ownership with title deeds, and farm size ranged from about 0.5 hectare to 10 hectares.

The Mukuria-Kyambogo Scheme lies at high mountainous altitudes (over 2,500 m a.s.l.), suited to growing specific vegetables, such as snow pea, garden pea and sugar snap. Here, the harvest period can be as long as 6 months unlike at lower altitudes where it rarely exceeds 2 months. Since the land available for cultivation at these altitudes is scarce, the large-scale commercial growers realized that they could not meet the quantity of orders demanded for the export markets in Europe, a gap that could be filled by medium and smallholder outgrowers. This interaction started in earnest around the year 2000. At Mukuria-Kyambogo, farmers are free to outgrow for a commercial company of their choice, and the group gets together to sort out issues related to water management, especially during the dry season when there is a need to ration the water. The companies operating in Timau, where the farmers outgrow, include Homegrown Ltd., Mastermind, Greenland, Sunripe, Vitacress, Everest, East African Growers, VegPro and Sunfresh. Some of the richer farmers have their own individual facilities (buildings that include offices, various stores, showers, sorting table, etc.) to conform to EUREP-GAP conditions. The less-well-to-do, especially those with small land parcels, build group facilities, as in the Tri-Hills Horticultural Self-Help Group (SHG).

Background to the Tri-Hills Horticultural Self-Help Group

The Tri-Hills Horticultural Self-Help Group is based about 5 kilometers downhill of the Mukuria-Kyambogo Scheme, at altitudes about 2,460 m. The group was started in the year 2000 by 20 farmers, mostly poor and young, having average farm sizes about 0.2 to 1 hectare. Membership has since grown to about 90 farmers (August 2004). The group utilizes piped gravity-fed sprinkler irrigation, with water from the Kagongogaceke stream, a tributary of the Teleswani river. Before 2000, they used to grow local vegetables such as potato, carrot and cabbage as individuals, getting together only to sort out water issues. The group credits one Mrs. Mugambi of Teleswani farm, with their introduction to becoming outgrowers for large commercial farms. They found it necessary

to become a group outgrower, since as individuals, it would have been impossible to meet the conditions of EUREP-GAP. Since they operate as a group, all the members outgrow for Vegpro, specializing in export vegetables which include snow pea, garden pea and sugar snap.

The Tri-Hills Group members have built offices/stores with voluntary labor, to conform to EUREP-GAP conditions. They have developed bylaws and have well-kept records that enable them to know if a member cheats, e.g., by bringing in outsourced produce or secretly selling produce to a competitor; such an errant member is punished. This is because their produce is sold as group produce and if the quality/quantity is unsatisfactory, the whole group gets punished by the client firm (e.g., cancellation of further orders). Due to the complexity of growing to meet EU conditions, the group members have been trained by the multinationals and the Ministry of Agriculture with support from the Japanese International Cooperation Agency (JICA) and Horticultural Crops Development Authority (HCDA). However, one of the major problems facing Tri-Hills SHG is the low prices offered by the multinationals, which leaves them with narrow profit margins. Furthermore, they do not have a voice in whatever prices are offered. The main question here is how to address pricing of produce because leaving these farmers to the forces of demand and supply may not be sensitive to their circumstances. Even then, the farmers stated that the main advantage of partnerships with multinationals was availability of stable markets, and delinking with the wily middlemen. The farmers were gearing up for the deadline of January 2005 to meet EUREP-GAP standards.

Collaboration between Large-Scale Commercial Farms and Smallholders in Timau

Large-scale commercial farming of horticultural produce for the export market in the Timau area has expanded rapidly in recent years, bringing with it competition. The need for vegetable produce suited to high altitudes, the scarcity of land and lack of adequate water for irrigation, led to a soaring demand for produce from smallholder outgrowers. The ensuing competition has been a blessing to the smallholder farmers having access to irrigation, and in recent years, many of them have converted from growing local vegetables to export horticultural crops, facilitated by well-organized partnerships between the smallholders and large-scale commercial growers. The partnerships involve developing Memoranda of Understanding (MoUs) between the commercial farm and the smallholders, either as individual or group contracts. In general, these MoUs cover all aspects of crop production, quality-control hygiene, record keeping and all aspects that will enable the produce to meet the EUREP-GAP conditions, as well as marketing rights for both parties. The large-scale growers also facilitate the implementation of these stringent requirements by providing training, extension services and supervision (which may include unannounced sampling), and seeds, fertilizers, pesticides, stationery, some post-processing and a guaranteed market. On their part, the smallholders grow the exact amount of crop as recommended, build the offices, stores and other physical infrastructure, follow through with recommended agronomic practices, and sell the produce solely to the contracted farm. In this way, a high-level capacity has been built among the smallholders and, in return, the large firms are able to get more produce to meet their orders from abroad, while good socioeconomic interaction between the smallholders and large firms has been greatly enhanced. The major commercial firms operating in the area, either active farms or exporters include Sunfresh, Mastermind, Greenland, Sunripe, Everest, East African Growers, VegPro, Vitacress and Homegrown Ltd. Homegrown Ltd. has been used as a sample to show how the partnership between large commercial farms and smallholder outgrowers works.

The Example of Homegrown Ltd.

Homegrown Ltd. is one of the leading large commercial farms in Timau, exporting fresh horticultural produce, and having partnerships with smallholder outgrowers. Homegrown deals only with individual farmers, who can be large scale (> 12 ha), medium scale (8-12 ha), or smallholders (< 2 ha). In special cases, the company also deals with group outgrowers, as with the Sirimon Cluster. The recruiting criteria remain the same, regardless of farm size. Normally, demand for outgrowers comes from the head office, based on orders for produce in the EU. The company staff then searches for outgrowers. The prospective outgrower first fills a prequalification form. The manager then sends a technical assistant (TA) to the farm to assess it. The company checks many things including financial capability of the farmer to meet production targets, condition of facilities such as stores/offices/sheds and general hygiene to meet EU standards, as well as accessibility. If the farm is very good and only the road is bad, the company sometimes sends its grader to clear the road. If the TA recommends the farmer, the Outgrowers Manager visits the farm to certify that it is okay. Once the farm is accepted, MoUs are drawn up and signed.

Homegrown's own farms specialize in runner bean, rhubarb, salad onion, baby leek and other vegetables for the EU market. Crops are changed regularly to meet market demands, including seasonal demands in Europe. The company also grows snow pea, garden pea and sugar snap but the quantities are not adequate to meet the orders. Thus, the balance is obtained from smallholder outgrowers. Productivity and quality from the outgrowers have been impressive, with some getting as much as 100 kg/day of garden pea, fetching about KSh36 per kg (\$0.45 kg⁻¹), but most farmers harvest about twice a week, meaning a farmer can earn about \$90 per week from garden pea alone. These, of course, are gross earnings, from which the costs of inputs are deducted by the company and the net earnings are much better than growing local vegetables. Currently, smallholders contribute 12.5 percent of the total production to Homegrown Ltd., and the company would like to see this proportion increase to 50 percent. There is room for growth.

Meeting the EUREP-GAP Export Standards

The major market for horticultural products from Timau is in Europe. Recent EU regulations demand that all foods sold in their markets must meet standards referred to as the "European Retailers Working Group on Good Agricultural Practices (EUREP-GAP)." Started in 1997, EUREP-GAP gives a set of lengthy tough protocols, which demand that the full history of a product in a supermarket shelf in the EU can be traced to the field it came from, the farmer who grew it, when he/she planted it, the seeds used, the pesticides applied, all agronomic practices used, the method of harvesting, post-harvest handling, etc. In addition, there are specific requirements for hygiene, environmental conservation, fertilizer, chemical types and use, including water management. Other protocols deal with social economic issues like housing for the workers, sanitation and sanitary habits, risk management, record keeping, workers' safety and social welfare. To meet these conditions, specific buildings must be put up separately to store seeds and chemicals, and there must be sorting sheds and an office in which all records are filed in a specified order. One of the medium-scale farmers, Mr. Musa has constructed all these structures, and follows the protocols very strictly. He has even employed a full-time farm manager to assist him. The smallholder farmers comply with EUREP-GAP by constructing group structures. Moreover, there are regular inspections by both the large buying farms as well as representatives of EU to ensure that smallholder farmers maintain the required standards. What is interesting about all this is that the outgrowers are quite willing to do all it takes to be eligible for the export market.

Impacts on Food Security and Poverty Reduction

The impacts of the partnerships between smallholder outgrowers and large commercial farms are best described by sharing the experiences of Mr. Musa Ikiara, a member of the Mukuria-Kyambogo Group Irrigation Scheme. Before the year 2000, Musa used to grow local vegetables such as cabbage, carrot and potato. To sell the produce, he would transport it to towns as far as Meru and Embu. He remembers a very uncertain time, and many were the days he sold his produce at very poor prices. He started growing export vegetables for various commercial farms around 2000. In 2003, Homegrown Ltd. was looking for smallholder outgrowers for snow pea to meet an order in Europe. The company staff came to inspect his farm and they were impressed by his activities, infrastructure and hygienic standards. He was contracted as an individual outgrower.

By Timau standards, Musa is considered a medium-scale farmer because he owns about 10 hectares of land. Therefore, this allows him to allocate his land to a rotation that enables a harvest every week throughout the year. He has divided his land into blocks of 0.2 hectare and every week, he plants 12 kilograms of either snow pea, garden pea or sugar snap as export vegetables. Crop rotation is done with potato, maize and wheat as food crops, increasing food security. For example, in one week, he gets two harvests of sugar snap amounting 250-350 kilograms. Since a kilogram of sugar snap fetches about KSh70 (\$0.88), the farmer earns over \$300 per week (or \$1,200 per month) from one product alone, and therefore much more for all other products. This is a gross earning and there are costs such as fertilizer, labor, pesticide and management. Even then, the profit margins are good. Mr. Musa is happy with the system and is already putting up a larger building to house offices, stores and showers and a separate building as a sorting shed as per EUREP-GAP conditions. Musa indicated that one of the main advantages of being an outgrower with the kind of contract he has with Homegrown Ltd. is that he does not have to worry as to where he will sell his produce or at what price as these are now quite stable. Generally, at these high altitudes, poverty is a greater problem than food security. However, in Mukuria-Kyambogo and in Tri-Hills SHG, access to niche export markets facilitated by partnerships with large commercial farms has promoted wealth creation leading to better living standards. This is quite evident even in the types of houses the farmers have built.

Lessons Learnt (Partnerships of Commercial Farms and Smallholder Outgrowers)

Although the concept of smallholder outgrowers working with large commercial farms is not new, especially in Kenya, what is striking about the Timau case is the level of professionalism with which it is done, and the ensuing success. Furthermore, the fulfillment of the stringent EUREP-GAP protocols by smallholder farmers for delicate vegetables shows that similar partnerships can be successful elsewhere, especially under less-demanding conditions. One aspect of modern-day smallholder farmers in Timau is that nearly all of them are literate and therefore can read instructions and keep records quite well. In addition, the use of mobile phones has greatly revolutionized communication, avoiding unnecessary wastage of time and resources. For instance, all the members of the Mukuria-Kyambogo Group Irrigation Scheme own mobile phones. Thus, the buying company can telephone to order produce of a specified quantity, enabling the farmer to harvest just the required amount. Moreover, farmers also call the company for various supplies or to communicate problems that may arise, improving efficiency. The inclusion of the approach is encouraging, given that farmers having only 0.2 hectare of land can benefit from export horticulture. The role of facilitation, training and supervision, availability of quality inputs, stable markets and the stiff competition among the large commercial growers were ingredients of this success.

Case Study 3: The Lare Water Harvesting Project

Location: Lare Division, Nakuru district.

Innovation: Water harvesting from road surfaces into small earthen pans and its utilization for supplementary irrigation, accompanied by high rates of adoption.

Origins of the Lare Water Harvesting Project

The importance of water harvesting for improving livelihoods and increasing agricultural production in dry areas has been well articulated (Critchley and Siegert 1991; Critchley et al. 1992; Hatibu and Mahoo 2000; Nega and Kimeu 2002) but its adoption in Kenya has been poor. Perhaps because of this, the Lare Water Harvesting Project has been a showcase of how rainwater harvesting can transform livelihoods within a relatively short time. Lare is a semiarid area receiving 600 to 1,000 mm of annual rainfall and lacking river water. Before the project, about 70 percent of all households experienced serious water-shortage problems, and the population relied on only four boreholes and some heavily silted dams. In addition, incidences of waterborne diseases, especially typhoid and amoebic dysentery, were very common. In a project that spanned 2 years between 1998 and 1999, farmers were trained in roof water harvesting, runoff water harvesting and simple water treatment methods. This project was a collaboration between Kenya Agricultural Research Institute (KARI) Njoro station, Egerton University, local NGOs, government extension and the UNDP (Tuitoek et al. 2001). Training modules were developed to empower farmers to be able to do their own site selection, calculate water-storage capacity, construct and maintain water pans, and use the water for irrigation of crops suitable to given conditions. Treadle pumps were introduced to draw water from the pans to the cultivated fields. Adoption of the water harvesting was impressive. In 1998, about 409 households had runoff harvesting systems and these increased to about 1,030 households by the end of 1999, an increase of about 150 percent. As of August 2004, over 2,000 households had water-harvesting pans.

Impacts on Food Security and Poverty Reduction (Lare)

One farmer, Mr. Joseph Kamau, exemplifies the great improvements in food security and poverty reduction as a result of water harvesting from a road adjacent to his 5-acre (2 ha) farm. Mr. Kamau used to be a tailor in the nearby market before he excavated the water pan during the drought of 2000. He dug the pan manually with his wife, a feat that took 3 months. The earth pan is about 700 m³, and since its excavation, it has never dried and shows no indication of seepage problems. The pan is well maintained and he takes care to avoid excessive silt buildup. Any excess runoff leaving the pan spillway is diverted into a big channel in the farm, where it infiltrates and improves overall soil-moisture storage. He uses a treadle pump to deliver water from the pan to the field. His major income-generating activity is a tree nursery irrigated using the pan water, from which he sells seedlings (passion fruit, grevillea, keiapple, eucalyptus, etc.) to other farmers. In addition, he has several mature trees from which he harvests seeds for sale. A simple calculation shows that from the nursery and seeds, he earns at least KSh160,000 (about \$2,000) a season, and this does not include income from food crops, livestock, high-value vegetables and timber from trees harvested. For instance, he has honey bees, several dairy cows, citrus fruits and sweet corn as cash crops and he always maintains a woodlot. A conservative estimate of the total income could be at least \$6,000 per year. Family food security is ensured by growing food crops such as maize, bean, potato and

fruits. In his own words, he would never consider going back to be a tailor as his life has improved so much in only 3 years. He wishes he had dug the pan earlier. In general, the farmers in Lare grow a wide range of marketable produce (leek, baby corn, brassica, onion, fruits) and there is no critical mass of a specific product for which large-scale marketing could really bring unstable income. All the same, the farmers have seen great improvements in their livelihoods.

Lessons Learnt from the Lare Water Harvesting Project

About 5 years ago, Lare looked very different and people's livelihoods were poorer. Technological input in the form of rainwater harvesting has transformed agriculture, increased food security and reduced poverty. Moreover, household health has been improved due to better nutrition and clean drinking water which is treated for suspended sediments, boiled and filtered so that it is clean. The pace of adoption of the innovations within the area is another important factor. Starting with about 400 pans in 1998, there are now about 2,000 pans, a fivefold increase in just 6 years. Although the physical conditions may have suited the innovation well, other factors also affect it; these are, for example, technology transfer from researchers, extension services and access to markets (as Nakuru town is within reach) and the fact that the Njoro Canning factory also buys some of the produce.

Case Study 4: Isiolo River Water Users Association (IRWUA)

Location: Central Division, Isiolo district (Isiolo River Catchment).

Innovation: Spring protection and conservation of riparian lands, leading to stabilized river flows, enhanced dry-season irrigation, environmental conservation and resolution of water conflicts.

Problems with the Isiolo River

The Isiolo river, one of the tributaries of the Ewaso Ng'iro North river in Kenya, originates from the northern lee slopes of Mt. Kenya starting out as a small stream. Along its length, the river is also fed by seven "ephemeral" springs which greatly augment the flow, especially during the wet season. The mean flow rate is about $0.1 \text{ m}^3\text{s}^{-1}$ at Isiolo town. Before the spring protection, the Isiolo river used to be an ephemeral stream, drying out to a trickle during the dry season. This resulted in water shortages in Isiolo town, while downstream water users could not get water for irrigation and pastoralists would lack water for their animals. Reasons for these low flows were given as cultivation of the catchment area and upstream irrigation withdrawals, while the roles of the tributaries to stabilizing river flow were greatly underestimated. In an effort to solve the growing water conflicts, the local people got together in 1995 and elected a water caretaker committee. In seeking solutions to the water conflicts and shortages along the Isiolo river, the then Caretaker Committee did a participatory river basin assessment, and they identified all seven springs that feed the Isiolo river were in a very poor state. They decided to start by rehabilitating the Rugusu spring.

Rehabilitating the Rugusu Spring

The Rugusu spring lies on public land, adjacent to the famous Lewa Downs Conservatory in the Isiolo district. Before its protection in 1996, the area around the spring had no riparian land. Cultivation was done to the spring edge, the catchment was overgrazed and livestock used to drink water directly from the spring's eye. The area was eroded, dusty, the water dirty, and the spring itself was ephemeral, drying out early in the dry season. It was at this time that the Caretaker Committee (IRWUA) with assistance from the Community Development Trust Fund (CDTF) embarked on rehabilitating the spring.

Interventions included first moving out the farmers from the riparian land around the spring and along the length of the Rugusu stream. This required a lot of training and sensitization, and not to allow their livestock into the spring area, which was fenced for a radius of just 5 hectares. The riparian land was then reafforested, and trees tended by an employee of the community. Within 2 years, the spring became perennial. A series of five water offtakes were also installed, three of them using hydram pumps. To avoid pollution of the river, water is pumped to a community watering area, where drinking water can be fetched from taps. Livestock watering is provided in separate troughs for large animals and for small ones (goats, sheep). A washing dhobi is also provided where people can wash clothes, including toilets and bathrooms. Some of the water is pumped and delivered by a canal to the Mashambani Irrigation Scheme about 20 kilometers away, while a few private farms have also been allowed to divert water for irrigation into their farms. There is a clear improvement in the ecosystem, with the spring producing a lot of water, and new auxiliary spring eyes having opened up in the catchment. Considering that the long rains of 2004 had failed, the impact of the Rugusu spring protection is remarkable as at the time of the study. In comparison, a

nearby unprotected spring at Kithima kia Mukuu, was dry, dusty, and a dirty trickle of water, livestock drinking from the spring eye.

Involvement of the Isiolo River Water Users Association (IRWUA)

The Isiolo River Water Users Association (IRWUA), which formerly operated as a Caretaker Committee of the Isiolo river catchment, changed names and was officially registered in 2003 as a community-based organization (CBO). The mandate area of IRWUA is divided into five geographic zones that include upstream, mid and downstream users, holding a total of 40 self-help groups (SHGs). Each zone has an elected committee and some zones have a combination of irrigators and pastoralists. Farmers are members of IRWUA by belonging to one of the various SHGs, and irrigation water is allocated by zonal committees, especially when there is a need for rationing. The zonal committees are then answerable to IRWUA, whose members are also elected. Water is not paid for, but a membership fee of KSh250 (about \$3) per farmer is paid to the SHG. Each SHG then pays IRWUA KSh3,000 (\$37.50) per group. The total irrigated area supported by IRWUA is 3,000 hectares, holding about 4,000 households. In addition, IRWUA raises funds through operating a tree nursery which earns about \$75 per year. Other than providing a forum for conflict resolution, IRWUA is also committed to the development of the Isiolo catchment and they plan to improve the other springs, and expand the area under irrigation, which is in great demand.

Impacts on Food Security and Poverty Reduction (Spring Protection)

There are many beneficiaries of the Rugusu spring protection. For instance, the Isiolo river flow has stabilized providing water throughout the year, and therefore reducing conflicts with downstream users, mostly pastoralists. The Rugusu spring water diverted by canal to farmers for irrigation at Mashambani, near Isiolo town has ensured water availability for irrigation, improving food security and reducing poverty. A sample calculation of farm-family incomes takes as an example one farmer, Mr. Antony Mureithi who belongs to Kirimani SHG and grows local vegetables, specializing in onion, tomato and kale. Water he uses comes from the canal, drawing from the flow of the Rugusu spring, and field application is by micro-basins. At the time of this study (August 2004), he had planted 1 hectare of onion, which he hoped to sell at a farmgate price of KSh20 (\$0.25) / kg. On this size of farm, he harvests about 8 tonnes, thus earning a gross income of about KSh160,000 (\$2,000), and his expenses are less than half the gross income. This is a good profit achieved in a period of about 4 months as onion grows very fast in the hot Isiolo climate. Thus in a year, the farmer can earn \$2,000 to \$6,000. The main problem includes water shortages and marketing.

Lessons Learnt from the Rehabilitation of the Rugusu Spring

Water scarcity and conflicts over water are top agendas affecting agricultural production. In seeking solutions to river management problems, planners and engineers need to look at all options, including the less obvious causes and opportunities. By adopting this approach, IRWUA succeeded in solving a multiplicity of problems affecting the Isiolo river regime, its hydrology and ecosystems, positively influencing human livelihoods by improving food security, water availability, health and poverty reduction. Another important aspect is the quick response with which the Rugusu spring recovered, and the natural methods used. In the Rugusu case, the spring eye was not

interfered with and the intervention was to return the spring to its natural state. Planning for water offtakes and allocation so that the riparian land is not destroyed again, and making use of the water for productive purposes (irrigation, livestock) provided the members with reason to support the initiative, and the system has been sustainable ever since. Community involvement, training and sensitization also played a big role in the community bringing it success, and therefore good management of the project. IRWUA intends to repeat the innovation in the other six springs, and to protect the Isiolo river from its source to the Ewaso Ng'iro. There are still constraints due to inadequate water for all the farmers who would wish to irrigate, while the other unprotected sections of the river and its tributaries still suffer environmental damage. Moreover, field water application methods are also quite inefficient as farmers use furrow and micro-basins. Marketing is a problem, especially since farmers grow conventional vegetables, and markets get flooded with produce from other irrigated areas of Kenya. However, these domestic problems can be tackled, and they do not diminish the type of lesson to be learnt here, namely that ecosystem protection of riparian lands and springs can provide water that is more plentiful and cleaner, while stabilizing river flows for the benefit of livelihoods and ecosystems.

Case Study 5: Mitunguu Irrigation Scheme

Location: Mitunguu Location, Nkuene Division, Meru Central district.

Innovation: Resolution of marketing constraints through bulk production of resilient produce (banana production).

Background to the Mitunguu Irrigation Scheme

The Mitunguu Irrigation Scheme started off as a tiny scheme in the 1920s when a furrow was excavated for human and livestock watering, but later used for small-scale irrigation of food crops. In the 1970s, the furrow was used to irrigate tobacco. In 1978, the Tana and Athi River Development Authority (TARDA) commissioned a feasibility study for improving the irrigation scheme, as part of the first phase of the National Development Programme aimed at utilizing the tremendous potential of the Upper Tana basin. Between 1980 and 1985, the scheme was upgraded involving detailed surveys, construction of a new intake, pipe layouts, cooperative society buildings and offices. The current scheme was commissioned in 1985 as a gravity-fed piped sprinkler system, drawing water from the Thingithu river. A cattle dip was also made as the scheme was an integrated project. Farmers started growing Asian vegetables such as dudhi, okra, chili, tindori, tulia as well as export vegetables like french bean (varieties; monel, guar and bobby bean). The original design was 400 hectares for 309 farmers, but the gross irrigable area is about 1,000 hectares. By the time of this study (August 2004), there were over 600 farmers practicing irrigation, mostly as a result of land subdivision. Water shortage is a common problem and rationing is practiced during the dry season.

Problems That Led to Revolutionary Changes in Production and Management

The Mitunguu Irrigation Farmers Cooperative Society (MIFCO) was founded in 1981, to provide services in operations, management and maintenance of the scheme. MIFCO was charged with the following responsibilities: a) maintenance of all irrigation structures from the intake, distribution network up to the farmer's hydrant, b) marketing of all farm produce, c) supply of farm inputs (certified seeds, knapsack sprayers, pesticides), d) provide transport and land preparation services, e.g., ploughing, e) offer credit to farmers, and f) create employment for the local people, i.e., through these supporting services meant to empower farmers to get started with irrigated agriculture. The society was in charge of all sales of produce and would give farmers inputs on credit while the latter would get their net earnings through MIFCO. During this period, MIFCO would sign contracts with exporters on behalf of the farmers, and the exporters would pay for the produce to the society. This lasted only a few years as net earnings to farmers started to dwindle. There was poor management and by 1992, most farmers had lost faith in the society. Some farmers began selling their produce directly to brokers, thereby avoiding payment for inputs and thus denying income to the cooperative society. Despite this, MIFCO has continued to be operational and although elections are regularly held, the society is almost irrelevant to the activities of most farmers. Its main activities have been reduced to providing hired transport and maintaining a tree nursery.

Meanwhile, in 1991, a consultant was sent to Mitunguu to advise on how to strengthen the extension service, encourage diversification and improve livestock production. He recommended the formation of the Mitunguu Water Users Association (WUA), which was in 1992. The WUA was responsible for water management and charged a fee of KSh400 (\$5) / acre / year. This meant that water allocation was removed from the mandate of MIFCO. This brought animosity in the

community because there were now two committees and farmers were answerable to two parallel organizations (MIFCO and MWUA). Again wrangles set in and early in 2004 MIFCO took back control of water management and the WUA was disbanded.

Getting Back in Control: Banana Becomes the Crop of Choice in Mitunguu

When the farmers of Mitunguu switched from selling their produce through MIFCO to dealing with brokers (middlemen), they found they were so badly exploited that soon there was no profit from their crops. Now, it was brokers who decided at what price they would buy produce as farmers were so disenfranchised. Moreover, some brokers would ask farmers to pick produce from fields, and fail to turn up or offer a very poor price once the crop is on the ground. Farmers were making heavy losses especially on export vegetables, which cannot be sold in local markets; yet the costs of inputs were escalating. By the mid-1990s, the situation was so bad that farmers started experimenting with other crops such as napier grass for dairy production, but milk markets around Mitunguu were poor. It was at this time that farmers also started growing bananas under irrigation. This was aided by the introduction by Kenya Agricultural Research Institute (KARI) and the Jomo Kenyatta University of Agriculture and Technology (JKUAT), of high-yielding banana varieties such as Dwarf Cavendish, Giant Cavendish, Lacatan, Valerie, Gross Mitchell and Uganda Green, which also are popular with consumers in urban areas. In addition, bananas do not require as much labor and pesticides unlike vegetables. Availability of a market, especially Nairobi, and the fact that banana is a semi-perishable meant that farmers could negotiate for best price, and also if need be, sell bananas in local markets. Within 5 years, Mitunguu was transformed into a banana zone, as the climate is generally suited to banana production. As adoption spread and more farmers used their land for bananas, transporters started coming to the scheme to buy bananas in large quantities, and therefore marketing improved tremendously.

Impacts on Food Security and Poverty Reduction

Food security is assured in all the households in the Mitunguu Irrigation Scheme, while the living standards of the people have improved tremendously, especially after marketing problems were tackled in the mid-1990s. Indicators of this are everywhere, including improved housing, the growth of the Mitunguu town, the services it offers, and health and education standards. One way to quantify this is through a case study of one farmer, Mr. Francis Mwobobia who bought his 3-hectare farm within the Mitunguu Irrigation Scheme in the early 1990s. At first, he grew export vegetables and flowers as well as tomato and although his harvests were good, he would lose out to middlemen as explained above. He then shifted to irrigated fodder for dairy cows in zero grazing units, but could not get a good market for the milk while milk prices were very poor (KSh12/liter or \$0.15/liter). In 1998, he shifted to growing bananas and has never looked back since. He exclusively grows the Mitchell variety, which he claims grows fast and yields well. He has modified the sprinklers by shortening the riser to a 30-cm height to reduce wetting of the leaves. The following is a sample of cost/benefit analysis from his farm; a full banana bunch weighs about 60 kilograms and sells for KSh500 per bunch for class A in Nairobi, as compared to KSh200-300 paid by brokers. On average, Mwobobia sells about 200 to 300 banana bunches a month, translating to at least KSh90,000 (\$1,125) per month. He has other pieces of land close to the main scheme and his target is to earn at least KSh2.4 million (\$30,000) a year, which is achievable. Mwobobia's biggest problem is lack of enough water to expand irrigation of bananas, especially in the dry season, when water is rationed.

He has teamed up with a group of 30 farmers and they used their own money to bring more water to their farms from a swamp upstream. Although brokers are still there, the buyers are many and the profit margins are good.

Lessons Learnt from the Resolution of Marketing Constraints at Mitunguu

From the foregoing it can be understood that farmers of the Mitunguu Irrigation Scheme had undergone rough times, which mirror the most common types of problems faced by smallholder irrigation schemes in Africa, mainly water shortages, management problems and marketing. Although Mitunguu farmers had not solved all their problems, they were making a profit all the same, because they were able to identify a product that had a stable market, and which they could handle within their means. Thus, even though marketing of the main cash crop in Mitunguu, the banana, is still done by individual farmers on a one-to-one basis, the success of the scheme can be said to lie in the application of a free-market system where demand for the product is relatively high, the crop in question has high profit margins, requires less inputs, little post-harvest handling and can be stored quite well. Moreover, the banana is a relatively resilient plant given the water shortages of the dry season, and as the area receives an annual rainfall of 1,348 mm, the plant is able to bounce back during the wet season. The influence of modern technology in providing farmers with training and high-yielding and marketable varieties as well as the availability of a good road linking the scheme to major markets as Nairobi, cannot be overstated. Mitunguu is an example of a scheme where farmers have shifted from being export growers to producers of local food crops, which boosts national food security, while also increasing the profits of the farmers.

CONCLUSIONS

This study set out to identify Bright Spots in smallholder irrigated agriculture in Kenya, of which five case studies have been presented. Given that the five form just a fraction of the innovative knowledge and experiences scattered around the country, there is great potential for identifying and learning from Bright Spots. Each case study is unique in terms of the innovations and lessons learnt. Moreover, the farmers have achieved positive impacts of innovations within a relatively short span of time, showing these to be “quick wins” if well adopted. In general, the technology-driven innovations identified were:

- Partnerships between smallholder and large commercial growers that have enabled the smallholder access to European export markets for fresh produce.
- Growing resilient crops in bulk such as bananas to allow the farmer a time-stretch over which to bargain for better prices without loss of quality of the produce.
- Developing strong water user organization with stakeholders from within and beyond the irrigation scheme to resolve water conflicts.
- Rehabilitating springs and riparian lands so as to stabilize river flows, allowing irrigation expansion even during the dry season.

- Rainwater harvesting and storage in earthen pans or tanks and its utilization for supplemental irrigation of high-value crops, in places lacking surface water sources.
- Identification of niche products that require minimal production inputs and niche markets.
- Value adding (processing, packaging) to improve portability and increase the market value of the produce.

We found that, regardless of how poor the farmers had been before the introduction of the innovation, positive impacts had been achieved in food security and poverty reduction. Examples of earnings by farmers and other stakeholders interviewed have been presented. At the community scale, leaders and government officials also provided valuable information. It was found that even though each Bright Spot was unique, there were common characteristics in almost all of them identified as:

- New knowledge—in nearly all cases, new knowledge/technology, such as introduction of exotic crop varieties, water-harvesting techniques and processing plants, had been injected.
- Training—all the Bright Spots had had a strong training component, as in agronomy, contract management, design of water pans and appropriate irrigation.
- Educational levels—the fact that on average, farmers are now literate and can therefore keep records and follow instructions is very important for commercialized agriculture.
- Capital investment—the injection of seed funding to jump-start the innovation, as smallholder farmers are sometimes too poor to raise the initial capital required.
- Markets—availability of stable markets, good prices, and avoiding middlemen were some of the most important factors.
- Cost-sharing—in most cases, the initial investment was a loan, which the farmers had repaid at an affordable rate. Repayments of 100 percent were achieved, particularly when access to markets was assured.
- Facilitation—the need for a facilitator, either government, NGO or private sector to help farmers access credit, negotiate for international markets or gain export-quality standards.
- Involving government institutions—involvement of government structures such as the use of existing extension staff, provides a policy environment conducive to conduct business, institutionalization of interventions as well as facilitating arbitration where conflicts arise.
- Infrastructure—supporting infrastructures, especially roads, are also a basic factor, and in some cases, the private sector, the community and NGOs had helped improve roads to facilitate access to markets; in addition, the availability of mobile phones has been a great boost to enhancing commercialization of agriculture.
- Youth—the involvement of youth gives the intervention momentum and vigor; nearly all the Bright Spots had a large number of youthful educated farmers eager to make money from farming (no alternative employment) and therefore, ready to try out new ideas.

- Land tenure—in all the Bright Spots, land is individually owned and titled.
- Water availability—generally, the innovations took place where water availability was assured, or formed part of the innovation; the importance of water availability cannot be overstated, even in seemingly wet areas, due to the poor temporal distribution of rainfall.

Despite their successes in Bright Spots, farmers still faced problems which can be summarized into three major issues: a) marketing, especially access to lucrative overseas markets, price instability, and the problem of brokers, b) administrative issues, such as sustainable management of group activities and resources, especially as farmers had lost confidence in cooperatives, and c) interventions to deal with water scarcity/management, as in nearly all the cases, farmers would like to expand production but water was limiting. Thus, other factors of production such as infrastructure, agronomy, livestock management, climate and social issues, and externalities such as pests and diseases are related to these three, and could be easier to manage if the primary issues were tackled.

The five Bright Spots are few and far between, yet the biophysical and social economic settings under which they operate are spread in many parts of Kenya, and also in Africa. The lessons learnt through smallholder irrigated agriculture provide simple, yet transferable technologies relevant to other smallholder farmers in Africa.

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Chapter 4

Community Empowerment: The Experience of the Northwestern Integrated Community Development Program in Somaliland

S. Omar¹ and M. Yonis²

ABSTRACT

The Integrated Community Development Program (ICDP), a project funded by the International Fund for Agriculture Development (IFAD) in nine districts of Northwest Somalia, Somaliland, has attained its success through the adoption of a community-based and integrated approach to development. The key drivers of ICDP successes are the provision of an integrated package of development and community empowerment. The integrated package of development to communities in a post-conflict situation, where all basic social services have been destroyed and communities have lost all their belongings, proved to be most relevant. Community empowerment in the ICDP program has resulted in an economic, social and institutional development and has proved to be instrumental in poverty reduction.

In a period of 4 years, the project has contributed to the self-repatriation of refugees. The ICDP support to agriculture, rural health, rural water supply, animal health, rehabilitation of feeder roads, local capacity building and rural financial services was an attraction for returnees. To improve food household security, the project supported the poorest of the poor by providing, on credit, tractor hours and ploughing by oxen to returnees who had no other means to cultivate their land. Other assistance to agriculture includes the provision of cash credit to irrigated farming, soil and water conservation and agricultural extension activities to improve both the quality and quantity of production. Enabling communities to gain access to markets through the rehabilitation of feeder roads is also an activity appreciated by the beneficiary communities.

In the semiarid climate of the program area where water is both expensive and scarce in the dry season the ICDP project has installed 39 water points by bringing water nearer to communities and decreasing the workload of women.

The rural health package is aimed at improving the knowledge, attitudes and skills of communities on health, and increasing access to basic drugs. Through implementing the project on the rural health component many remote rural communities in the program area have access to health services. Thus, with improved household food security, access to rural health and clean potable water, improved management of local institutions, and access to rural financial services, the ICDP project is expected to contribute to the overall goal of poverty reduction in the program area.

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INTRODUCTION

Somalia is one of the world's poorest countries, and its people suffer from the highest chronic malnutrition rates in the world. Even more than a decade after the end of the civil war, the security situation in Somalia has not returned to normal. The well-being of rural communities depends almost entirely on weather conditions and the health of the local natural resources.

In addition to the devastating effects of war and the breakdown in public services throughout Somalia, this predominantly rural country has suffered from droughts, livestock bans by its trading partners (due to the alleged incidence of rift valley fever), and restrictions on informal financial transactions (including remittance channels) in the aftermath of 11 September. The resulting economic shocks have intensified the stress on local survival strategies and on the natural resources these depend on, leading to a markedly visible deterioration in the economic conditions.

The Somali people and their partners in the development community thus face a complex challenge in rehabilitating the economic base and enhancing nutrition and food-security levels. Agriculture and rural development projects operate within a post-conflict environment and in a governance vacuum where even the most basic public services are absent, especially in rural areas.

IFAD AND THE BELGIAN SURVIVAL FUND IN SOMALIA

IFAD³ had had a number of projects in Somalia before the outbreak of the civil conflict in the early nineties. The conflict eventually led to the termination of all operations except for the BSF-funded Beyond Relief Program (BRP), which was moved to the northwestern areas (Somaliland) in 1997, due to security risks in south and central Somalia.

The remarkable success of the "Government of Somaliland" and its constituency in ensuring a stable, democratic and peaceful environment has generated a stable flow of returnees. However, most refugees return to their homes with no savings, only to find that their lands have overgrown with bush, eroded, or otherwise depleted due to neglect since the onset of the war. The "Government of Somaliland" has not been granted recognition by the international community, and thus lacks access to Overseas Development Aid (ODA) and to international capital markets to help finance public service and raise resources to support the local population. Services related to health, education and other basic needs are often absent or weak, particularly in rural areas, and are largely dependent on direct foreign aid. The BRP thus addressed an important gap in supporting marginalized rural areas. The key ingredient in ensuring participation and successful implementation of program activities has been the integrated and community-driven approach adopted by the Program. Technical assistance and program implementation have been undertaken through close consultation with targeted rural communities.

The strong performance of BRP led to the approval of a second phase in 2001 that expanded from two districts to nine districts. The Northwestern Integrated Community Development Program (NWICDP) is in one of these districts. The United Nations Office for Project Services (UNOPS) implements the program as a service provider to IFAD, and has established a project management unit to carry out day-to-day implementation in the field in line with IFAD's program design and appraisal.

³ Acronyms are spelt out in annex 2 of this chapter (p.74).

THE NORTHWESTERN INTEGRATED COMMUNITY DEVELOPMENT PROGRAM

This community-driven program under the conditions described above aimed at providing communities with opportunities to rebuild both assets (such as farms, dams and homes) and livelihoods, and to reconstruct the social fabric. NWICDP thus addresses an important gap in marginalized rural areas. The purpose of NWICDP was to improve the food security and health of target communities of the Hargeisa and Awdal regions. The program duration is 6 years and it has a budget of Euro5.3 million. Targeted outcomes include:

- Increased agriculture and livestock production.
- Improved healthy, preventive, promotional and curative behavior of rural people in the Hargeisa and Awdal regions.
- Improved rural water supply.
- Increased incomes of targeted rural women petty traders.
- Equal access of rural men and women to project benefits.
- Improved management capacity of local institutions and service providers.

Thus NWICDP can be described as a multi-sectoral program with the following components: agriculture, livestock, rural water, rural health, feeder roads, rural financial services and local capacity building. Implemented in a public service vacuum characterized by little government intervention, NWICDP has developed a close interaction with targeted communities. The Project Management Unit (PMU) has adopted a successful participatory approach with strong community ownership, ensuring that interventions address their communities' expressed needs.

The NWICDP program is an integrated and participatory program. It is relevant to the needs of the people: activities in animal health, rural water and rural primary health care have restored valuable social services for the communities, and support to agriculture has enabled many poor farming families to cultivate their land. Support to agriculture has also contributed to the food household security and nutrition of farmer beneficiaries and their families. In addressing a number of key problems and constraints facing rural communities, the multi-sector, integrated approach has engaged communities and enabled them to make significant progress in the livelihoods of their members. By responding to the needs of communities, the program has developed a strong dialogue with, and commitment from, target communities.

The NWICDP carries out many different activities to improve the livelihoods of the rural communities in the project area. It promotes water-harvesting and soil-conservation measures. It also provides micro-loans to irrigable areas for renting of a tractor by the hour, pumps and pipes. Community revolving funds provide opportunities for the poor to rent oxen for traction power in dryland areas, develop feeder roads to improve market access, train Traditional Birth Attendants (TBAs) and nurses. Revolving funds are also used to provide medical supplies at village pharmacies and to veterinarians for semi-nomadic communities.

NWICDP supports participation and strives towards creating a learning environment where secondary and primary stakeholders have equal access to the information generated through a shared process. The information generated is usually discussed in the monitoring and evaluation meetings or events (such as monthly, quarterly, 6 monthly and annual program review meetings).

Participation is not just seen as a means to improve project delivery but more as a measure to ensure that benefits go to the target groups and that the capacities of local institutions at grassroots level are built. NWICDP's experience has shown that participation motivates communities to assert their collective ownership over development interventions and ensures that development impacts are sustained in the long run. Hence, for a community-centered approach, capacity building at grassroots level is crucial.

To ensure community participation, Participatory Rural Appraisals (PRAs) are conducted in target communities prior to the implementation of development interventions. The activities to be implemented for a community are then derived from the Community's own Action Plan (CAP) of the PRA conducted in that community. Then NWICDP staff carries out a social mobilization of the target group for the planned intervention, aimed at formation of self-governing institutions at the grassroots level. This not only facilitates the development of the local institutions, skill enhancement and capital generation for creating community assets but also helps in the process of articulating community needs and prepares plans for implementation.

Because of the relevance of the NWICDP program to the situation on the ground and its participatory approach, successes have been achieved in providing a package of development to the most needy of the communities. The program successes are also a result of the people-driven approach pursued by NWICDP. Community contribution in both kind and cash and the management of development interventions by the communities have implanted a sense of ownership in the communities and are anticipated to ensure sustainability of development activities.

As a community-based program, NWICDP involves communities in all stages of the project cycle: planning, implementation, monitoring and evaluation of all project activities. From the start-up workshop to the implementation of program activities there is full community participation in the NWICDP program. Interventions at the community level are guided by Community Development Plans that are developed in each village using PRA techniques. Communities normally contribute labor towards any construction and maintenance, and subcommittees of the Village Development Committees (VDCs) oversee and monitor program interventions.

NWICDP finds that it is also necessary to provide training for skills development and management of local institutions at community level to strengthen the communities as self-governing institutions as shown in the schematic representation, figure 1. The capacity building provided by NWICDP to the local institutions occurs at district and village levels.

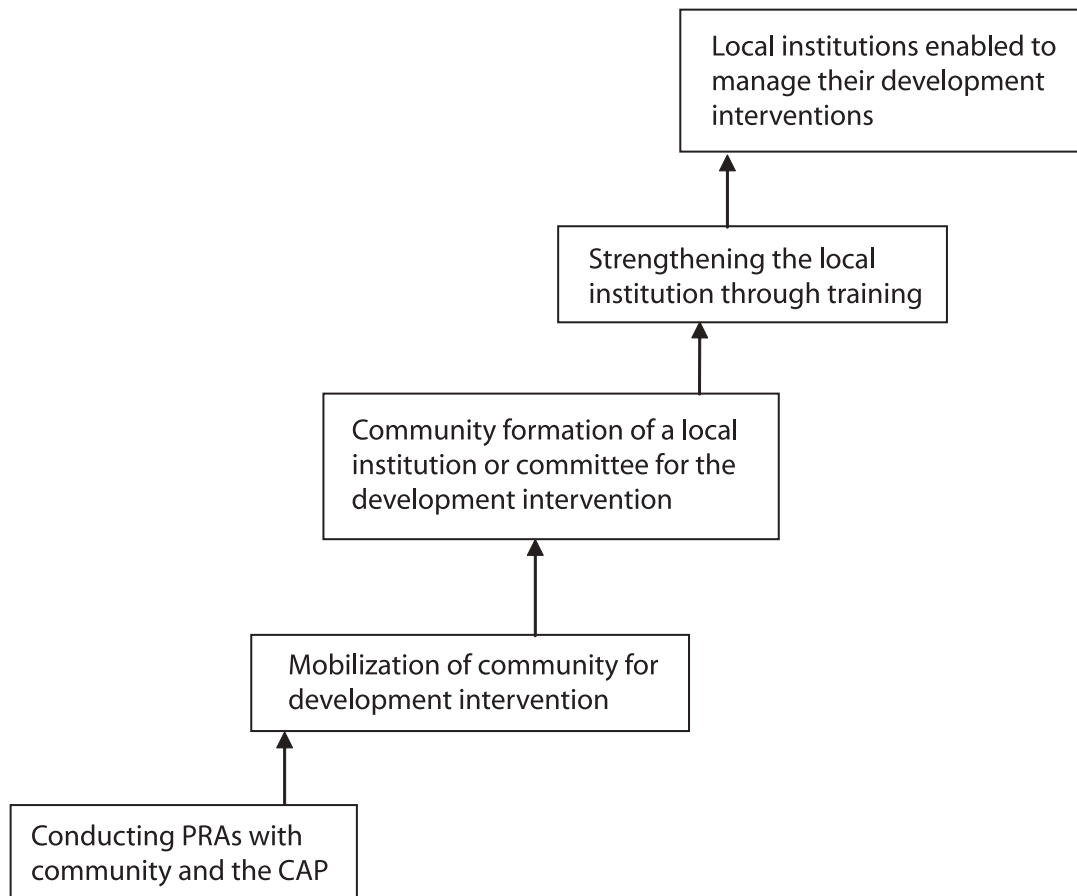
At the district level the capacity building included:

- Training of District Agriculture Extension Officers (DAEOs) on agriculture extension activities.
- Training Technical Units (TUs) on data collection, PRA techniques, community development, survey management, monitoring and evaluation.
- Good governance workshops for District Development Committee (DDCs).
- District work plan review workshops.

At the village level capacity building was on:

- Good governance workshop for VDCs.
- Training on management of agriculture micro-credit revolving funds for Community Credit Associations (CCAs).

Figure 1. Schematic representation of capacity building at community level.



- Training of Water Management Committees (WMCs) on management, maintenance and sanitation of water points.
- Training Community Health Workers (CHWs) and TBAs on nutrition and growth monitoring.
- Training of VDCs, CHWs and Village Health Committees (VHCs) on the management of the Drug Revolving Funds.

Some of the operational local institutions that benefited from the capacity building include VDCs, CCAs and WMCs. The VDC is the most important organization at community level and is fully involved in the planning, implementation, and monitoring and evaluation of NWICDP development activities in their respective villages. The CCA is a subcommittee of the VDC and is responsible for the management of revolving funds from the selection of eligible borrowers among their communities, opening up bank accounts, collection of loan repayments to the redistribution of loans to new borrowers. The WMCs are responsible for the management, sanitation and maintenance of the NWICDP-supported water points.

Hence, as a result of the local capacity building provided by NWICDP to local institutions, target communities are able to organize and manage development interventions implemented in their communities. Agriculture micro-credit, drug revolving funds, rural water facilities, feeder road

maintenance and community-growth monitoring centers supported by the program, which are in full swing, are all well managed by the trained local institutions at the community level.

Strengthening the local institutions at district and community levels facilitates the work of NWICDP because these institutions serve as partners in development during the implementation of the program, and at the end of the project term they will be responsible for the sustainability of the development interventions.

As a result, program interventions are highly appreciated by the target group. This is demonstrated by the enthusiastic response of targeted communities to the self-help and self-reliance approach, and the challenge of prioritization and local resource mobilization. The program has thus turned the crisis in trust in government and the sense of self-reliance into an opportunity for increased participation. Communities commit to PRA-facilitated Community Action Plans and contribute to all components. The program thus facilitates a strong process of empowerment, enabling the poor to help themselves. One strong example of the commitment, self-reliance and enthusiasm of the target population is the (in-kind) community labor participation in feeder road construction in collaboration with NWICDP and their shared and well-organized maintenance of the roads after the rains without further facilitation.

PARTICIPATORY MONITORING AND EVALUATION (M&E) LEARNING APPROACHES DEVELOPED IN THE ADDIS ABABA WORKSHOP

To enhance participatory learning approaches in the ICDP program, a monitoring and evaluation workshop was conducted for all the program staff in Addis from June 22 to July 2, 2004. The ICDP M&E system was reviewed and a more participatory M&E system was developed for the project. The output of the workshop was an M&E implementation guideline document. The document will be subject to continuous revision and adaptation as the implementation of the ICDP activities is an evolving process.

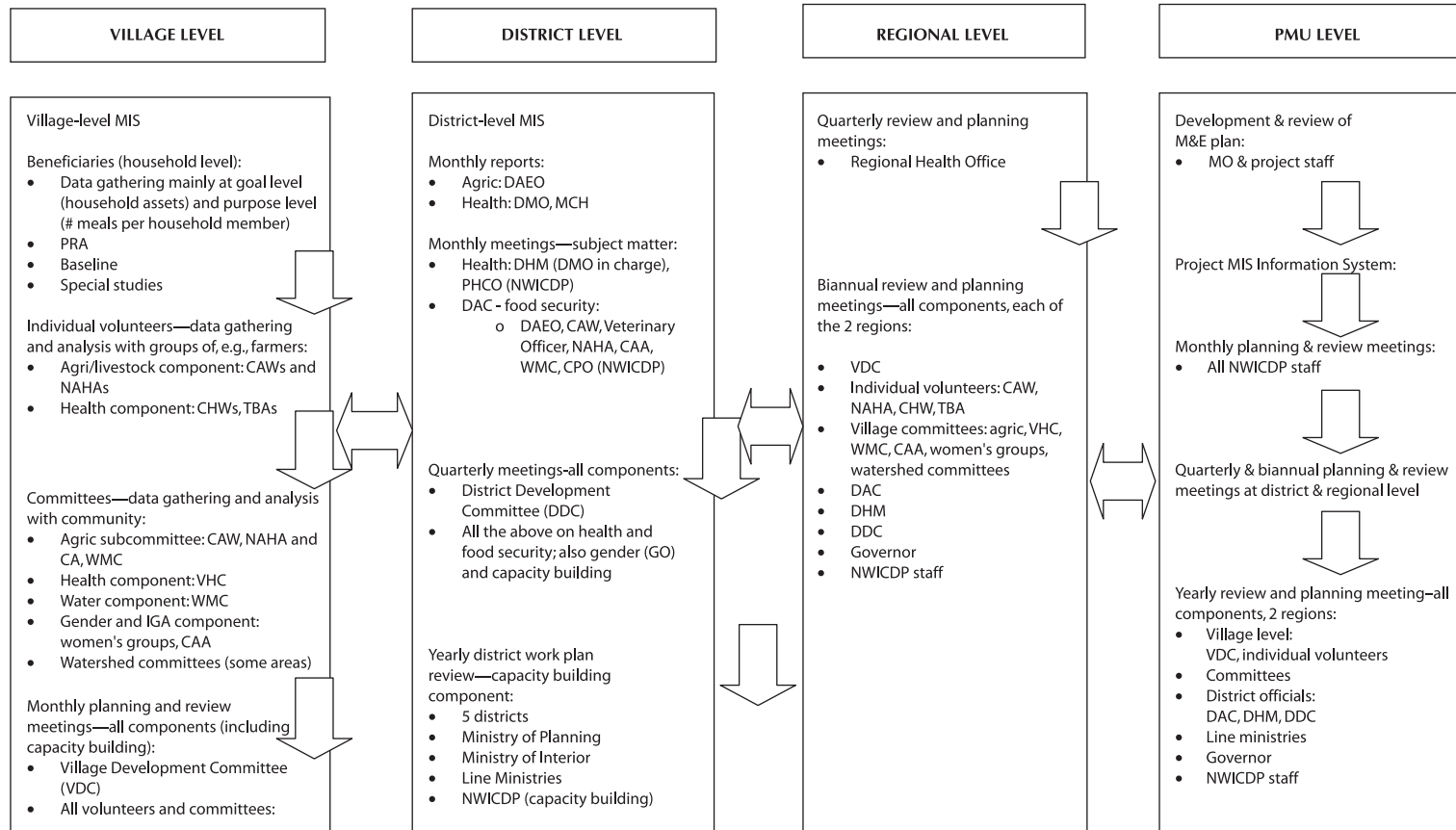
Also during the workshop the different levels of participation were discussed and the staff indicated that mainly the “functional participation” is valid for ICDP. However, after undertaking a stakeholder analysis in terms of the level of participation of different stakeholders in different phases of the project cycle, and after discussing issues around “creating a learning environment,” the ICDP staff realized that there is a need to increase the true level of participation by stakeholders in all phases of the project cycle and a plan to involve stakeholders in planning and progress review meetings was agreed upon as shown in table 1.

Table 1. Involvement of stakeholders in ICDP planning progress review meetings.

| Level | Type | Frequency | Participants | Types of information |
|---------|-----------------------------------|----------------|--|--|
| Village | Subject matter committee meetings | Weekly/monthly | <ul style="list-style-type: none"> - Agricultural subcommittee (on food security): CAWs, NAHAs, CAA, WMC - VHC:CHWs, TBAs - Women's groups (IGA) - Watershed committees (some areas) | Review and planning of current issues related to the subject matter and weekly/monthly work plans. |
| | Village (VDC) meeting | Monthly | <ul style="list-style-type: none"> - VDCs, agricultural subcommittee, VHC, WMC, women's groups, watershed committees | Review and planning of village level activities (including NWICDP activities), VDC progress report |

| Level | Type | Frequency | Participants | Types of information |
|----------|-----------------------------------|------------------------------------|---|--|
| District | Subject matter committee meetings | Monthly | <ul style="list-style-type: none"> - DAC (food security): DAEO, CAWs, Veterinary Officer, NAHAs, CA, WMC - DHM team: DMO, VHCs, PHCO (NWICDP) | Review and planning of current issues related to the subject matter and work plans. |
| | District (DDC) meetings | Quarterly | <ul style="list-style-type: none"> - DDC: all components– all committees - all NWICDP staff | Review and planning of progress. Adaptation of AWPB if necessary. Reports to UNOPS. |
| | District work plan reviews | Annually | <p>Of the districts supported by NWICDP: (capacity building components of)</p> <ul style="list-style-type: none"> - Ministry of Planning - Ministry of Interior - Line Ministries - NWICDP staff | Review of progress in the districts. Adaptation of the next AWPB. |
| Region | Reviews | Biannually | <p>Per region: all components:</p> <ul style="list-style-type: none"> - Village representatives (all committees) - District representatives - Line Ministries - all NWICDP staff - UNOPS | Achievements, failures and reasons, inputs for AWPB at regional level. Evaluate relevance, sustainability, efficacy. Reports to IFAD/BSF. |
| PMU | Staff meetings | Monthly | All NWICDP staff | Review and planning of activities. |
| | Project review meetings | Annually | <ul style="list-style-type: none"> - Village representatives (all committees), - District representatives - Line Ministries - Governor - all NWICDP staff - UNOPS - IFAD/BSF | Achievements, failures and reasons, inputs for AWPB at the project level. Adaptations of the overall project strategy (if possible and necessary). Evaluate relevance, impact, sustainability, efficacy, efficiency. |
| | MTR | Mid-term of the project duration | Village representatives (all committees), District representatives, Line Ministries, Governor, all NWICDP staff, UNOPS, IFAD/BSF | Project evaluation: relevance, impact, sustainability, efficacy, efficiency. Adaptation of the overall strategy. |
| | Final evaluation | At the end of the project | Village representatives (all committees), District representatives, Line Ministries, Governor, all NWICDP staff, UNOPS, IFAD/BSF | Evaluation: relevance, impact, sustainability, efficacy, efficiency. |
| | Supervisory mission | Twice per year; if and when needed | If and when needed: village representatives (all committees), district representatives, Line Ministries, Governor, all NWICDP staff, UNOPS, IFAD/BSF | Subject matter specific support missions. |

Figure 2. Overview of the M&E system used by NWICDP.



The ICDP M&E system is a participatory, integrated system of reflection and communication supporting project implementation. It describes how different stakeholders participate in the project, what and how information needs to be shared and collected, and how a learning environment is being created. It supports the project in managing for impact. An overview of the system is given in figure 2.

AN OVERVIEW OF ICDP ACTIVITIES AND IMPACTS

NWICDP's interventions have successfully demonstrated a number of cost-effective activities for improving the livelihoods of rural communities in the program area. Positive impacts on the target group can already be seen in:

- Demonstration plots for intercropping of legumes with sorghum for higher yield, training of the Ministry of Agriculture and community agricultural workers in improved crop production.
- Bund construction and other inexpensive watershed management technologies to restrain extensive soil erosion and gullies.
- Construction of earth dams with animal troughs to harvest rainwater runoff and to provide separate livestock watering points without contaminating the water for human consumption and construction of concrete, covered, shallow wells to access aquifers in or close to riverbeds during the dry season.
- Cash and in-kind credit in the form of oxen, tractor hours for ploughing dryland farms. Providing cash credit to irrigation farms for purchase of pumps and inputs as well as credit for medical drugs and for animal health workers.
- Providing training of TBAs, nurses, community health workers and beneficiaries to improve knowledge and skills of rural health staff. Developing the health information system and the referral mechanism at community and district levels.
- Rehabilitation of rural feeder roads and their maintenance facilitated by community management committees.

In the following sections, we will highlight some of these points.

Gender

As an IFAD-funded project, the task of NWICDP is to reach out to the poor in general and to women in particular and to empower the rural poor to have a greater say in improving their livelihoods. Hence, helping women to participate at the decision-making level and in having access and control over project benefits are of primary importance to the NWICDP program.

Through the implementation of the gender program, for the first time, 50 percent of the VDCs have effective women representation. This gives women the opportunity to have a say at the decision-making level. Since they have access to, and control over, project benefits, 585 female-headed

households received tractor hours on credit to plough their land, while another 422 female-headed households received oxen for ploughing. In irrigated farming, 40 women received cash credit to improve their farms. In 39 communities there is now water near the homes, which relieved women of the arduous daily task of fetching water from long distances.

In the health sector women are becoming both the implementers and beneficiaries. Training for nurses and TBAs, who form the bulk of the rural health staff, is provided by women. Members of the trained staff provide preventive health measures to the communities, targeting the most vulnerable, women and children.

Agriculture

Agriculture is a major component of NWICDP as well as the pivot of rural poverty eradication and food security. NWICDP interventions have successfully contributed to commodity development and food security. The program addresses the issue by providing credit tractor hours, oxen credit, irrigation credit revolving fund, soil and water conservation, community empowerment, provision of agricultural services, and the provision of animal health services through the training of community animal health workers.

Agriculture in the program area is of two types: rain-fed farming and irrigated farming.

Rain-fed farming. Rain-fed farming forms the breadbasket of NW Somalia. Cultural practices include broadcasting of seeds which is practiced for almost all field crops. Land is ploughed using a locally made plough pulled by oxen, or using hired tractors with disc ploughs. The farmers grow a mix of late and early maturing sorghum and produce 500 kg ha⁻¹. Maize, millet, cowpea and sesame are the main crops grown in the dryland.

The objective of providing tractor hours and oxen for ploughing is to increase agricultural production by allowing farmers to cultivate more land, improve food security and on-farm income-generation activities and to initiate and create community-owned and -managed revolving funds to support target communities in agriculture and other rural productive investments.

The credit is managed by committees selected by communities (CCAs). To increase the capital of the revolving fund, NWICDP provides an annual topping of the number of hours that had already existed in the previous years, and the new loan will be part of the credit provided earlier. Over the past 4 years, 30,000 tractor hours on loan were distributed to 68 rain-fed farming communities in the program area, and 12 such communities received 516 oxen (258 pairs) for animal traction.

Impact. Impact studies conducted by the M&E Unit on the tractor hours and oxen ploughing showed the following:

- Altogether 10,642 hectares of land were cultivated through the provision of 30,000 tractor hours and 516 oxen ploughing on loan, benefiting 16,800 farming families.
- There was an overall increase in the production of main crops. Before the provision of the oxen ploughing and the tractor hours the average production of sorghum per farm was 15 sacks each of 60 kg. With oxen and tractors, there was an average production of sorghum of 45 sacks per farm when the rains were good. Without these oxen and tractors, most of the poor farmers were not able to plough their land or ploughed very little of their farms by borrowing pairs of oxen from their neighbors or using whatever they found such as a camel or a donkey.

- For many returnees the provision of the oxen ploughing or tractor hours gave them the hope to return to their own lands as the oxen ploughing or tractor hours from the project gave them the means to cultivate their farms. Now such farmer families reside in their original rural areas and can produce food for their families.
- Ploughing by oxen is preferred by most farmers because they are familiar with oxen ploughing and have traditionally used it. Oxen do not need spare parts or fuel and can be available for the whole cropping season. Thus, farmers use oxen for land preparation before the beginning of the rainy season and for cultivation and thinning in the rainy season. Moreover, germination is better with oxen ploughing when rains are showery or small because tractor ploughing tills the land deeper and requires heavier rains.
- The quantity and duration of rain vary from year to year. Poor farmers used to miss the right planting time often as they waited for oxen to become available. For the last 2 years, poor farmers who received oxen ploughing or tractor hours on loan ploughed their farms at the suitable time and cultivated more land.

Irrigation farming. Irrigated agriculture is mainly concentrated along the sides of dry streambeds and around a few springs, where irrigation water is obtained from dug wells by using water pumps and from canals. The average farm area is 2-3 hectares, which is devoted mainly to the cultivation of horticultural crops, such as orange, guava, mango and papaya. In addition, vegetable crops, such as tomato, lettuce, onion, cabbage, carrots, etc., are also grown.

The revolving credit provided to these communities is used by the farmers to improve the production system by investing in badly required irrigation structures, such as replacing or repairing the pumps, buying new pipes, rehabilitation shallow wells or constructing new ones, and expansion of the irrigated area. In fact, each farmer identifies the chief constraints and addresses them to enhance profitability.

Prior to the disbursement of the loans, a credit needs assessment was carried out by the project staff. From the findings of this needs assessment the loans were provided to invest on needed structures and equipments; the loan is repaid in three instalments. A CCA was established for the irrigated farms as for the rain-fed farms.

Impact. Eleven communities where irrigated farming is practiced were provided with a total cash credit of \$79,437. The total number of farmers receiving the credit was 220. As per October 2004, two of the communities had received loans. The impact of this credit provision was as follows:

- More than 50 percent of the farmers invested their loans in securing water for their farms by digging or rehabilitating shallow wells. Having access to water for irrigation has resulted in increasing production. In some irrigated communities, such as Ruqi and Elbardale, the production in most of the farms has doubled. Having access to water has also encouraged many farmers to increase the cultivated land. Irrigated farms in Ruqi have grown in size averaging 2 hectares.
- People in the program area are agro-pastoralists and it is very common to find farmers in both irrigated and rain-fed farming communities who buy livestock with their extra income. In Ruqi, an irrigated community, the number of sheep in the farms has increased from an average of 14 to 20 per farm.

Extension services. Although the extension services of NWICDP are at their nascent stage, a remarkable success has been achieved: a) over 300 farmers adopted the introduction of early maturing drought-resistant variety *einigazal* from Sudan, and b) around 30 communities that were growing only sorghum and maize adopted intercropping with legumes. The first step toward the building of agriculture extension was the hiring of a consultant and the training of DAEOs, CAWs, and project staff, and the establishment of demonstration plots. The project faces the challenges of low agricultural productivity. To address this challenge the project adopted the introduction of drought-resistant high-yielding crops, compost, better cultivation practices, and conducted farmers' seasonal workshops, farmers' field days, demonstration plots, CAWs trainings and CAW-exchange visits. However, the quick adoption of the newly introduced systems and new varieties by the farmers is a colossal task. Although progress has been made, especially the introduction of new cowpea varieties (e.g., *einigazal* from Sudan), the adoption of intercropping sorghum with legumes, the dissemination of information related to the results of demonstration trials to the nearby farms and other villages take place during field days, seasonal workshops and CAW-exchange visits organized by NWICDP. The program has not brought about the hoped-for increase in agricultural production as yet. Season to season variation in rainfall is also greatly affecting demonstration plots. The consequence is bumper harvests in some plots in some seasons and crop-searing drought in others.

On irrigation farms, problems have arisen as groundwater supplies used for irrigation face depletion.

Soil erosion. In the project area, soil erosion is a serious problem and gully formation is taking away farming and grazing land. This is due to clearing and cultivating the land or overgrazing of pasture. This exposes the soil to the battering effect of raindrops which breakdown the soil aggregates and seal the surfaces so that percolation of rainwater is diminished and runoff correspondingly increased. The natural slope of the land increases the runoff velocity. Some gullies may also develop from the depressions of cattle tracks or footpaths. According to the findings and recommendations from surveys conducted for the project by a team of a soil scientist and an engineer, the project adopted agronomical and mechanical measures suitable for watershed management. These are aimed at reducing runoff, stopping existing gullies, preventing the formation of new gullies, increasing crop and pasture production through the construction of contour bunds, check dams, stone lines and loose stones, planting land surrounding the gullies and providing oxen blades to maintain the bunds.

Catchment management. Two watershed management activities were implemented in the Hidhinta and Aburin communities of the Hargeisa region. The activities undertaken were:

- Bunding on farms: 81 in Hidhinta and 90 in Aburin totaling 82 kilometers of bunding.
- Bunding the lands surrounding the main gullies and diverting water from the gully head and sides into four balleys (earthen reservoirs).
- Planting the land surrounding the gullies.
- Provision of oxen blades to maintain the bunding.
- Training 300 farmers on soil-erosion techniques.

As the impact of the activities, it was observed that the water retention in the banded farms had increased and the crops in the banded farms looked promising. Also, farmers at the beginning

of the watersheds, who abandoned farming for several years because of the swift water runoff, were able to plant this year after the bunding.

Rural water provision. Water is a scarce commodity, and improvement of access to water is a main priority of NWICDP. The type of improvement was specified as “balleys” intended for provision of water for both livestock and human consumption. A typical balley has an average volume of 7,000-10,000 m³ and can be sufficient for 200 families and their livestock for 3 months. Construction of shallow wells made water available for human consumption depending on the quality of underground water. Prior to the implementation of balleys and shallow-well facilities, NWICDP staff involved the communities in site selection and in planning implementation and maintenance of the water facility. Upon completion of each water facility, the community selected a management committee which is responsible for management and maintenance. NWICDP extends training to such communities.

Traditional use of water from the balley has serious sanitation problems. Animals are driven into the balleys and most of the time urinate and defecate in the water. People go into the balley and fetch water. To improve this serious water-sanitation problem, NWICDP introduced a technical modification system whereby the balley is fenced and a water tank is constructed outside the balley using a one-piston water pump. People can then fetch water from the taps of the tank. Animal troughs constructed outside the balley can also be filled from the tank for watering livestock. The technical modification protects against contamination so that people using the balley will have access to clean drinking water.

The project has supported the construction of 24 balleys, 15 shallow wells and drilled a borehole for 39 communities with an estimated number of 109,200 inhabitants and 390,000 heads of livestock. The impact of balleys and shallow wells is as follows:

- Water is nearer to many communities and their livestock. Some of these communities used to fetch water in the dry season from sources that were as far as 20 to 30 kilometers away. The distance of fetching water has been reduced to an average of 2 kilometers in the dry season as a result of the project support to rural water.
- Water nearer to the communities has relieved women of the task of fetching water from long distances and has saved them time for other household chores.

The Dilla community is located at the centre of a dryland area and has no permanent source of water within a radius of 30 kilometers. The priority of the Dilla community was to have a borehole, but an earlier geophysical survey indicated that the area has no groundwater. The Dilla community approached NWICDP and requested the drilling of the borehole. NWICDP hired a geophysicist-consultant, who surveyed the area and detected water at 100 meters between two faults. Drilling of the borehole commenced and good-quality water was pumped out. Two 100-year-old males said “ever since the colonial period, we have been asking government and development agencies to drill a borehole for this community.” Certain trees growing in the area were an indicator for them that underground water existed. This borehole was a breakthrough for all water developmental agencies working in the area of Dilla and its surroundings. The borehole encouraged other developmental agencies and the Ministry of Agriculture to explore more boreholes in the whole areas of Western Somaliland.

Feeder roads. Feeder roads lead to main roads between rural productive centers, such as irrigated or high potential rain-fed agricultural area, and the markets. Generally, the strain on the use of feeder roads is exacerbated by the mountainous landscape and the impact of concentrated rainfall on soil with extremely low absorption rates. The resulting runoff leads to serious gully formation, seriously damaging the feeder roads. As a result, farmers in some areas have no access to markets.

In other areas, the situation is less serious, but the transportation cost of their produce doubles and, affects the profitability of the farmers. The primary purpose of this activity is to improve access of farm produce to markets and to generate immediate increase in the incomes and assets of poor households. After the PRA is conducted, the program rehabilitates feeder roads for the community if they meet the following criteria selected by the communities:

- The communities and the parts of the feeder roads proposed for rehabilitation are within the program area.
- The communities have drawn up a map and a feasible road rehabilitation scheme for the self-help program.
- The communities demonstrate adequate capacity for village leadership and mobilization for the self-help program.
- The request for feeder-road rehabilitation meets a priority need of the majority of the people living in each community applying for assistance.
- The improved road would benefit the poor and vulnerable groups including women.
- The communities demonstrate their willingness to contribute to this program.

Rehabilitation of 6 feeder roads of 15-kilometer length was carried out. The impact was:

- Before the rehabilitation of the feeder roads people did not use vehicles to reach the market. They used donkeys and camels. They used the vehicles if they found one for other purposes. One of the latter was to transport the seriously sick to hospital. Chartering a vehicle in El Bardale for an emergency used to cost \$114-142 but only \$28 after rehabilitation. With the improved condition of the feeder roads one could go to market or take a sick person to town any time. Transport ceased to be a big problem for what used to be land-locked communities.
- All types of vehicles became available including small cars and Toyota Hillux pickups. For example, watermelon growers in Baki send a wireless message for trucks when the crop is ready and they may say “you find 30 to 50 trucks to be loaded in the valley.”
- The journey to the market with camels and donkeys that took days was reduced to hours for all communities. Monthly visits to markets increased markedly. Milk traders visit the markets daily to sell milk, which had no market before. Farmers now have the flexibility to choose from a wide range of crops to grow. In the past, they were confined to crops that could be kept well for a considerable time.
- Farmers’ markets expanded from Borama and Arabsiyo to Hargeisa and sometimes to Burao and Djibouti. Transport costs have dropped. Sales of produce by irrigated farmers per farmer have jumped in all areas after the rehabilitation of the roads resulting in an increase in income of the farmers. The average increase in production of sales of fruit was 10 times greater and that of vegetables 7 times greater. For the communities, Baki, Boon and Hariirad the average sale of water-melon has increased from 0 to 148-ton truck loads. The daily milk sales in Elbaradle community have increased from 0 to 37.5 liters.

- New economic activities have emerged. In Jidhi village, the number of business activities (shops, tea shops) has increased from 2 to 6. Goods unavailable can now be found in the village.
- All communities have benefited from access to health services in the main towns.

Rural health component. At community level, annual refresher courses for CHWs and TBAs are given to improve the overall health services of the communities, in particular, those of mothers and children. Training of nurses of Maternal Child Health (MCH) centers at district level is meant to improve and upgrade the knowledge and skills of the health staff at district level. Members of the MCH staff serve as referral sites for the CHWs and TBAs at village level. After the training of nurses on the establishment of a Health Information System a reporting and data collection system was established between the health posts and MCHs. The Health Information System (HIS) is operational. Trained CHWs and TBAs work in community growth monitoring centers to educate mothers on the importance of feeding their families on locally available nutritious foods. The training is expected to strengthen the linkage between CHWs and TBAs in terms of implementation of the health activities and enhancing the mobilization and raising of health awareness at the community level. The program is linked to 24 food demonstrations conducted every year for mothers in selected communities. The Qaloc, Hidhintia and Gabiley District Hospital committees were trained in revolving fund management for sustainable use of drugs.

The program has implemented the following activities over the past 4 years:

1. Refresher training to 87 CHWs and 179 TBAs.
2. Basic training to 77 TBAs and 6 CHWs.
3. Training on nutrition and growth monitoring for 31 CHWs and 30 TBAs.
4. Training 6 VDCs, 2 CHWs and 6 VHCs on management of drug revolving funds.
5. Training nurses: 47 on management and control of common diseases, 27 on counseling, 54 on HIS and 69 on STDs.
6. Training 21 artisans on slab making.
7. Construction of 230 latrines.
8. Provision of 125 TBA kits.
9. Provision of 31 weighing scales to CHWs.
10. Establishment of 31 Growth Monitoring Centers.
11. Conducting of 60 meetings for communities' discussions on Female Genital Mutilation (FGM).
12. Conducting of 72 food demonstrations for mothers.

The impact of the program was as follows:

- A HIS is established for the Ministry of Health immediately after the training of 54 nurses from 54 MCHs. Health data are compiled from all health facilities in each region on monthly and 6-monthly bases, and quarterly, biannual and annual health reports were produced by HIS officials in each region for the first time as a result of NWICDP training on HIS.
- Latrine construction supported by the health component of the program is very much appreciated by many rural communities in the program area and this has led to the construction and use of pit latrines for the communities. Latrine use is expected to contribute to the health and sanitation of the target communities. It has also made the rural women comfortable in using the latrines anytime during the day.
- Thirty-one community growth monitoring centers were established in rural health posts and are operational after training of 31 CHWs and 30 TBAs on nutrition and growth monitoring and the provision of weighing scales. Prior to the training, growth monitoring of children was conducted only at MCHs of main towns.
- Many rural communities in the program area do not have trained TBAs. Seventy-seven such communities now have trained TBAs who can attend to the delivery of babies after the basic training of 77 TBAs and the provision of TBA kits. The immediate effect is that the TBAs are functional. From the program area 179 TBAs were also given refresher training to upgrade their knowledge on safe delivery. All trained TBAs are active.
- Impact monitoring by the VDCs in these communities showed that people have adopted using the ingredients used in the food demonstrations, and farmers were asking for cowpea and sesame seeds.
- Counseling service was totally absent from the health facilities in the program area. A training conducted for 27 MCH nurses on reproductive health problems has made counseling services available at peripheral MCHs and is operational.
- The integrated health supervision activities carried out by the Ministry of Health and supported by NWICDP have brought about the availability of health data from the health facilities on a monthly basis. The supervision visits have also technically helped the rural health staff as the supervisors are qualified personnel who can contribute to the improvement of the knowledge and skills of the rural health staff during their visits.

LESSONS LEARNED

1. The absence of a recognized government has facilitated NWICDP's direct implementation and its close interaction with targeted communities. This is unlike other funded IFAD projects where implementation is through governments.
2. The PMU has adopted a highly successful participatory approach with target communities ensuring that interventions address their expressed needs. This has created a strong sense

of community ownership where communities have responded enthusiastically to the self-help and self-reliance approach, and the challenge of prioritization and local resource mobilization. The program has thus turned the crises in trust in government and the sense of self-reliance into an opportunity for increased participation. Communities are committed to PRA-facilitated Community Action Plans and contribute to all components. The program thus facilitates a strong process of empowerment, enabling the poor help themselves. One strong example of the commitment, self-reliance and enthusiasm of the target population is the (in-kind) community labor participation in feeder-road construction in collaboration with the program, and their shared and well-organized maintenance of the roads after rains, independent of any facilitation by the program.

3. Besides the communities' strong sense of ownership, a well-qualified, dedicated PMU has been a critical factor in the success of the program. UNOPS/ESARO has provided key support to procurement, personnel administration, flow of funds and other management services. The "Government of Somaliland" has been given training that could place its agencies in a position to play a larger role in providing public services to its constituency.
4. The Belgian Survival Fund has enabled IFAD to play a very important role in reducing rural poverty and improving livelihoods in one of the poorest countries of Africa, in a manner fully in line with IFAD's strategic objectives. NWICDP is probably the largest rural development project in Somalia as program assistance to Somalia's rural communities is very limited. The role of NWICDP in this post-conflict situation has therefore been critically important.

CONCLUSIONS

NWICDP has demonstrated the benefits of working directly with impoverished rural communities to improve their livelihoods by providing them with the basic necessities to survive and to prosper under otherwise unfavorable conditions.

Combined with its participatory approach and close dialogue with rural communities, the significantly visible impact of NWICDP has made it a flagship for rural development efforts in Somalia.

However, the basic needs of rural communities throughout the program area (and of rural communities under similar circumstances in other parts of "Somaliland") cannot be met with the program's limited resources. A particular challenge lies in reducing soil erosion and improving water conservation and water supply, which have high returns but which require additional investment resources.

For the expansion of the ICDP beyond the current regions of Hargeisa and Awdal in NW Somalia, the program could be repeated and expanded to cover other areas in Somalia. Considering the vast area of the country and the different ecosystems, seven such projects could be planned covering various regions from the north to the south of Somalia, with some differences in the interventions to suit the variable natural potential and human needs in these areas. Substantially more support is needed to address these areas of high impact. Funds may be estimated at \$2.5 million and include \$1 million for 10 catchments, \$50,000 for geographical surveys, \$700,000 for 20 boreholes, a total cost of \$250,000 for 50 shallow wells, and a total cost of \$500,000 for 50 reservoirs.

ANNEX 1

Somaliland Government and Policy Environment

1. Somaliland proclaimed its independence from Somalia in 1992, following years of persecution under Said Barre's totalitarian regime. Somaliland has an area of about 137,000 km² and its population is 3.5 million. Although not yet recognized as a sovereign state, Somaliland is increasingly recognized as a remarkable but untold success story in Africa.
2. Drawing its legitimacy on traditional councils of elders, the self-proclaimed Government of Somaliland proceeded to enforce peace and security by demobilizing and demilitarizing the various militias. It subsequently introduced democratic institutions and successfully ran elections for the President as well as for local municipalities.
3. Somaliland's greatest success is the relative stability that it has enjoyed for 10 years. It has held democratic elections (municipal and presidential) and aimed to hold parliamentary elections in March 2005. It has a traditional bicameral Parliament. It has a police force, a defence force, its own currency and a relatively free and lively press. A landmark measure of success took place in 2003 when the candidate from the Gudabirsi, the second largest clan in Somaliland, was peacefully elected as President.
4. The success of Somaliland in establishing peace and democracy is doubly remarkable in the strategic area along the coast of the Horn of Africa, where foreign pressures and interference are reportedly high. Somaliland is leading by example and demonstrating to its Somali brethren that perhaps the most viable solution for peace and growth in Somalia would be through a federal model where local administrations exercise full autonomy, including control of security and taxation.
5. Reportedly, one of the primary obstacles blocking the international community from recognizing Somaliland is a fear of negative impact that recognition may have on reconciliation efforts in the south. Consequently, Somaliland does not benefit from direct ODA and the country suffers from severe funding shortfalls for government-led rural development activities.
6. The government's liberal policies and focus on security, however, continue to promote substantial investments into Somaliland from the Somali Diaspora. Remittances to Somaliland are expected to amount to \$425 million a year. This is a significant commitment of resources and demonstrates the great interest and confidence shown in Somaliland by those for whom Somaliland has been their home or to which they are returning. Indeed, refugees from different parts of Somalia are moving from neighboring countries to Somaliland. It is estimated that 600,000 of the population of 3.5 million are refugees who have returned in recent years. The ultimate winners are the young and the local communities, who now have room to overcome poverty and can finally aspire to improved standards of living.
7. Under the circumstances, the government's focus on security and its reliance on decentralized local or traditional institutions/systems for social and economic development (together with

the lack of interference in development projects), constitute a significantly positive policy stance. Indeed, it is a major contribution by the authorities in favor of an environment that enables the poor to overcome their poverty. This is highlighted by the fact that, in light of the progress it is making (in contrast to other parts of Somalia and the Horn of Africa region), Somaliland has placed fewer demands on the international community for emergency humanitarian assistance. Moreover, the Somaliland authorities' support to IFAD operations has enabled IFAD to effectively reach rural poor communities and enable them to overcome their poverty, using direct mechanisms that are community-driven and do not require government involvement.

8. The position of Somaliland in key policies that affect poverty reduction is as follows:
 - i. *Capacity of the rural poor and their organizations.* The attitude of Somaliland authorities towards rural organizations is considered very supportive and positive, with minimal to no interference and an easy registering processes. To a large degree, rural communities are self-governed and traditional local institutions play an active role in ensuring socially responsible governance. The democratic spirit of Somaliland and the cohesion between local communities and central government (promoted through extensive decentralization efforts) ensure a strong dialogue between government and rural organizations.
 - ii. *Access to productive natural resources.* Somaliland, which is sparsely populated, and the rural populations in particular are not constrained by access to land. Customary law applies and land markets have functioned without government regulation. Owned land is not always registered; however a cadastral registration system is being supported by UNDP with the endorsement of the Somaliland authorities. The government supports the efforts of NGOs and other partners in improving or facilitating access to water though it does not have adequate resources to pursue this itself. Water user institutions exist and operate locally without government interference. Pluralistic agricultural extension services are encouraged. However, government resources for extension are very limited and the extension system is still weak or absent.
 - iii. *Access to financial services and markets.* Micro-finance and remittance flows are facilitated with increasing emphasis on financial regulation/supervision. All financial services are private but the legal framework remains weak. The investment climate is very encouraging, with liberalized markets and simple procedures for registering small and medium-size enterprises or initiating trading business. Markets operate free of government control except for taxation of livestock exports at key ports. Both produce and input markets are privately controlled and privately run. Market access roads are being extended using development assistance, including those reaching poor rural communities.
 - iv. *Gender.* Literacy rates are low for both men and women but there is some effort being made in enhancing participation of girls in schools. Statistics are not available. Women have always had the right to vote and the current foreign minister is a woman. Women can also be elected, though actual representation in parliament is a problem. Women participate in rural organizations, including village development committees. Yet there remains much work to be done in empowering women.

- v. *Governance relative to rural development issues and activities.* Agriculture is seen as Somalia's heritage and its importance in poverty reduction is recognized. Policymaking, however, is limited as are budgetary resources and allocations. There is an adequate measure of decentralization and devolution. As mentioned earlier, resource availability is limited. Locally elected representatives are highly responsive and actively compete for local support. Rural people participate in local planning and decision making through VDCs and other community institutions. But sanctions are rarely enforced against officials who accept bribes.

ANNEX 2

Acronyms

| | | |
|--------|---|--|
| BSF | - | Belgium Survival Fund |
| BRP | - | Beyond Relief Program |
| CAP | - | Community Action Plan |
| CCA | - | Community Credit Association |
| CAW | - | Community Agriculture Worker |
| CHW | - | Community Health Worker |
| DAEOs | - | District Agriculture Extension Officers |
| DDC | - | District Development Committee |
| FGM | - | Female Genital Mutilation |
| HIS | - | Health Information System |
| IFAD | - | International Fund for Agriculture Development |
| M&E | - | Monitoring and Evaluation |
| MCH | - | Maternal Child Health |
| MOH | - | Ministry of Health |
| NWICDP | - | Northwest Integrated Community Program |
| NGO | - | Non Governmental Organization |
| NENA | - | Near East North Africa |
| ODA | - | Overseas Development Aid |
| PMU | - | Project Management Unit |
| PRA | - | Participatory Rural Appraisal |
| STD | - | Sexual Transmitting Diseases |
| TU | - | Technical Unit |
| TBA | - | Traditional Birth Attendant |
| UNOPS | - | United Nations Office for Project Services |
| UNDP | - | United Nations Development Program |
| VDC | - | Village Development Committee |
| VHC | - | Village Health Committee |
| WMCs | - | Water Management Committee |

Chapter 5

Farmer Empowerment through Farmer Field Schools

G.S. Khisa¹ and E. Heinemann²

ABSTRACT

In any company, program, or activity to be undertaken, there is a need for all key players to gain a common vision and have relevant technical tools in place for the tasks at hand. In the private sector, studies show that up to 1 year of close apprentice like training is used when establishing new offices or factories. The case of agricultural programs is not significantly different.

Farmer Field Schools (FFS) represent a significant step forward in agricultural education and extension. Traditional top-down technology transfer systems have a role in some aspects of agricultural development, but human capacity building required for the creation of independent commercialized farmers and farmer organizations needs new approaches. FFS still provide specific technical skills and also organizational skills and practice, analytical skills and practice, and basic group assets, such as trust and confidence, required for joint enterprises.

This paper presents a case study of FFS in the IFAD/FAO IPPM³ FFS Program in Kenya. Included is a brief look at what an FFS is, the evolution of the FFS model in Kenya, innovations introduced by the IPPM FFS Program, and the impact of FFS on the skills, capacity, organization and confidence of smallholder farmers. The paper concludes by looking at some of the lessons learnt and challenges for FFS in Kenya.

WHAT IS A FARMER FIELD SCHOOL?

A Farmer Field School can be described as a community-based practically oriented field study program, involving a group of farmers, facilitated by extension staff (public or private) or, increasingly, by other farmers. The FFS provide an opportunity for farmers to learn together and test and adapt practices, using practical, hands-on methods of discovery learning that emphasize observation, discussion, analysis, and collective decision making. Discussion and analysis are important ways to combine local indigenous knowledge with new concepts and bring both into decision making. The process aims to build self-confidence, encourage group control of the process, and improve group and community skills. Experience from various FFS projects in Kenya and elsewhere has shown that the participatory training and extension through FFS, which emphasize farmer learning and experimentation, can indeed have a significant impact in relation to both technical innovation development and farmer empowerment.

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³Acronyms are spelt out in annex 1 of this chapter (p.89).

The aim of the FFS is to build the capacity of farmers themselves to analyze their production systems, identify problems, test possible solutions and eventually adopt the practices most suitable to their farming system. The knowledge acquired during the learning process enables farmers to adapt their existing technologies to be more productive, profitable and responsive to changing conditions, or to test and adopt new technologies. The training in FFS seeks to assist farmers in developing their ability to make critical and informed decisions that will render their crop production systems more productive, profitable and sustainable.

The duration of a typical FFS is one or two cropping seasons. It consists of a group, usually 20-30 farmers, who set up a group field study on the crop(s) or livestock of their choice. The group is responsible for the care and maintenance of the study enterprise (crop) covering all aspects of the cropping cycle, from soil preparation, through planting, weed control, pest and disease control, harvesting and post-storage to marketing of produce. The approach is a season-long training following the phenological development of the crop. The field is the “teacher” and its conditions define the curriculum while the plants form the most important learning material. By following the whole cycle of the chosen enterprise farmers gain skills and learn to make management decisions applicable to any stage in the crop-development cycle.

As an extension approach, it is a dynamic hands-on, innovative and participatory discovery learning process, built upon the principles of adult education. Every learner is a potential trainer and the facilitators must be technically strong. FFS enable farmers to discover and learn about their own agro-ecology and integrated management. On the basis of this knowledge, they become independent and confident decision makers—experts in their own fields.

The cornerstone of the FFS methodology is the Agro-Ecosystem Analysis (AESA).⁴ Based on regular field observation, the AESA aims to enable farmers to analyze the interaction between crop and other biotic and abiotic factors coexisting in the crop field, and in doing so, to better understand the problems and opportunities encountered in the field and to come up with management decisions based on these findings. The farmers work in subgroups of 4 or 5 persons under the guidance of a trained facilitator to enhance the participatory learning process.

The AESA is the main decision-making tool used in FFS: the observation of the crop is usually weekly, fortnightly or monthly, although the frequency may vary according to the field conditions, the characteristics of the enterprise studied, and the growth stage. By conducting this exercise regularly in small groups, farmers develop a mental checklist of indicators to be observed when monitoring their crops and through the process they improve their decision-making skills.

AESA is a four-stage process starting with field observation. During this stage the small groups learn to sample the crop and carry out the structured observations of their crop. Growth stage, insect and other small animals—both destructive and beneficial—weed status, crop health, weather condition, soil condition, and any other factors that can have a bearing on the crop performance are all recorded in the field observation. The facilitator’s role is to assist in recognizing and identifying ecological roles of organisms found in the field. The next step is for the farmers to detail the field observations on a presentation-size paper. This step reinforces field observations and creates a record of field activities. Each group prepares its presentations with a summary of data, a picture of the field situation, and decisions from the group, as the management required in the field. The facilitator’s role is to move from group to group, asking questions and making observations as well. The third step is where each small group presents its results and decisions to the FFS as a whole.

⁴ AESA is defined as the establishment by observation of the interaction between a crop/livestock and other biotic and abiotic factors (living and nonliving) coexisting in the field.

This presentation by participants strengthens presentation skills and requires groups to defend their decisions with ecological arguments. The last step is where the whole group synthesizes the presentations from each small group for collective implementation of the decisions arrived at. The facilitator's role during this stage is to guide farmers to arrive at informed decisions and help them harmonize the different decisions from the different subgroups.

At all stages of the analysis, farmers' own experiences are incorporated. Drawing and self-presentation during this process reinforce learning. This is done throughout the season. As the problems and decisions being studied overlap with similar issues in participants' fields, there is a strong "learning readiness" element. This is a 2- to 3-hour process.

In addition to the field analysis, there are two other activities in each learning week. One of these is on group dynamics, leading towards team building and organizing skills for the group itself. The other activity is commonly known as a special topic. This usually includes a special study such as a pest or disease, or crop varieties that are performing well in the community, or marketing, or farming as a business, etc. The duration of these two activities is typically an hour or two, so the entire FFS session is 4-5 hours long.

EVOLUTION OF THE FFS MODEL IN KENYA

The FFS approach was initially developed by an FAO project in Southeast Asia as a way for small-scale rice farmers to investigate, and learn for themselves, the skills required for, and the benefits to be obtained from, adopting new crop-protection practices in their paddy fields.

The first Field Schools were established in 1989 in Central Java during the pilot phase of the FAO-assisted National IPM Program. This program was prompted by the devastating insecticide-induced outbreaks of the brown plant hopper (*Nilaparvata lugens*) that was estimated, in 1986, to have destroyed 20,000 hectares of rice in Java alone. The Government of Indonesia's response was to launch an emergency training project aimed at providing 120,000 farmers with field training in integrated pest management (IPM), focused mainly on reducing the application of the pesticides that were destroying the natural insect predators of the brown plant hopper. The training was based not on instructing farmers what to do, but rather on empowering them through education to handle their own on-farm decisions, using experiential learning techniques developed for nonformal adult education purposes.

Since then, the approach has been replicated in a variety of settings beyond IPM. At the same time there has been a shift from a focus on a single constraint of a single crop (IPM for rice-based systems) to an emphasis on the multiple aspects of crop production and management, to cropping systems, to non-crop/forest (livestock production, etc.) to natural resource management (soil fertility, water conservation, etc.) to sociocultural dimensions of community life (food security and nutrition, savings, health, HIV/AIDS, literacy training, livelihoods, etc.).

Since its start in Asia, the FFS approach has been extended to several countries in Africa and Latin America. Kenya was one of the first countries in Africa to be exposed to the FFS approach. In 1995 it was introduced on a small scale in Western Kenya for maize-based farming systems. Initially supported under FAO's Special Program for Food Security (SPFS), for which Kenya was one of 15 pilot countries, the approach was then spread to other parts of the country and was extended to Uganda and Tanzania by the FAO. In 1999, it was then expanded further, and with support from IFAD, the FAO Global IPM Facility launched an East African subregional pilot project for FFS, to cover three districts in Western Kenya and two districts each in Uganda and Tanzania.

Bringing the FFS approach to East Africa required a range of adaptations and modifications of the initial approach, in order to make it applicable for the specific farming systems of the region, with its wide diversity of crops grown and where pests are not necessarily the major production problems. The East African context also provided specific challenges, different from those in Asia, such as long distances between farming communities, limited national funding for public extension, and highly unpredictable weather patterns with frequent droughts.

Over the years, the program has responded in two ways. First, instead of using IPM as the principal entry point for the Field Schools, a more holistic and responsive approach was developed—Integrated Production and Pest Management (IPPM), which enables group members to choose any priority production-related issue as the Field School’s entry point, and to diversify the focus of the Field School away from an initial focus on maize-based IPPM to other crops, enterprises and livelihood-related issues, such as soil fertility management, soil conservation, livestock production, etc. Second, to ensure the Field Schools’ relevance in the complex and diverse farming systems of East Africa, the program introduced a syllabus which includes both a “focus topic” (generally based around a key crop or farm enterprise), studied for the entire 30-week duration of the Field School, and a variety of “special topics,” studied over one or two sessions. Both sets of topics were selected by the groups themselves.

Following the success of the IPPM program, several new FFS approaches were initiated in the region and the approaches were expanded to new enterprises and study topics. For example, in Kenya, the UNDP-funded PFI-FFS project was started in 2001. This included FFS on such diverse topics as bee keeping, soil management, etc. At about the same time, The International Livestock Research Institute (ILRI) initiated the Livestock FFS project under DFID funding, with the aim of adapting the FFS methodology to dairy production. In central Kenya, an FAO-funded initiative was launched, focusing on export vegetable production, while KARI initiated a pilot project to scale up successful soil-fertility management technologies, etc. East Africa also launched FFS activities in integrated nutrient management in Embu. Indeed, such was its uptake that by the end of 2003, over 1,600 farmer-led and extension/research-led FFS had been run in Kenya. The numbers of FFS, the diversity of topics, and FFS innovations make Kenya a leading area in Africa for FFS development.

The Case Study: The IFAD/FAO IPPM-FFS Program in Kenya

The East African subregional project for FFS on integrated production and pest management was established to study the impact of FFS on rural poverty reduction. It covered three countries: Kenya, Uganda and Tanzania and it was implemented over a period of three seasons (1999-2000, 2000-01 and 2001-02). It was implemented by the ministries of agriculture of the three countries and local governments, with the collaboration of the Global IPM Facility of FAO, and the financial support of IFAD.

For the purpose of this paper, the focus will from now on be the Kenyan component of the program.

The project was implemented in Bungoma, Busia and Kakamega districts in Kenya's Western Province, all of them poor districts, badly affected by HIV/AIDS, high population densities, declining farm sizes and deteriorating soil fertility. Rural livelihood options there are precarious.

In line with the group-driven approach to the selection of FFS topics, the schools focused on a range of crop enterprises, including vegetables, maize and bean intercrop, groundnut, sorghum, sweet potato, and local chicken. Using the AESA described above, a typical FFS session/meeting would generally cover the following activities (this example is actually based on an FFS on sweet potato):

8.00 – 8.15 a.m. Prayer, roll call, recap and briefing on the day's activities: The host team leads the other farmers in prayer, finding out who are present, reviewing previous activities, and briefing the other farmers on the proposed activities of the day.

8.15 – 8.45 a.m. Field observation: Split into small groups, farmers make observations of the whole field, and then examine 5-6 plants per plot, recording the vine length, number of leaves, number of branches, weeds intensity, insect pest infestations, disease incidence, availability of beneficial insects and any other relevant details.

8.45 – 9.15 a.m. AESA: Each group prepares a drawing of its field observations, including information on the condition of the plants, pests and diseases, natural enemies of insect pests, weather, soil and water conditions, etc.

9.15 – 10.00 a.m. Presentations and discussions: Each group presents its outcome and discusses its observations and conclusions with the other FFS members. The whole FFS group reaches a consensus on the crop management practices that they will carry out during the coming week.

10.00 – 10.20 a.m. Group dynamic activity: This activity aims to stimulate attention and participation, as well as strengthen group communication and increase solidarity.

10.20 – 11.30 a.m. Special topic: The facilitator guides the group in experiments, lessons, exercises and discussions on a special topic, identified by the group itself, related to what is actually occurring in the field or the community.

11.30 – 12.00. Review of day's activities, planning for next session, evaluation, announcements and closing prayer: Farmers evaluate the activities of the day and plan for the following session and identify the activities and special topic to be addressed.

In total, 471 FFS were established under the program, as shown in table 1. With an average of 25-30 members per FFS, the program reached a total of about 13,000 farmers.

Surprisingly perhaps, over 60 percent of these were women (table 2). Less surprisingly, studies conducted during implementation found that the vast majority of FFS members are drawn from the middle and poorer strata of the communities within which they live (Khisra and Wekesa 2003). As may be expected, the majority of better-off farmers are less interested in engaging in relatively time-demanding, collective activities, and are also less-inclined to participate. There is every reason to believe that FFS are, to a large extent, self-targeting.

Table 1. Number of FFS established.

| | Number |
|------------|--------|
| Staff-run | 199 |
| Farmer-run | 234 |
| DAO/NGOs | 38 |
| Total | 471 |

Table 2. Gender of FFS participants.

| | Male | Female | Total |
|--------|-------|--------|--------|
| Number | 4,885 | 8,108 | 12,993 |

As to the groups themselves, many of them were in existence prior to the project. But there is no evidence that these groups are more cohesive or dynamic than groups established specifically for the project. However, by and large, it appears the groups are sustainable: today, some 85 percent of the FFS supported under the program remain operational.

Innovations Introduced under the Program

The grant system/revolving fund model: To finance the individual FFS, the program pioneered the introduction of a system of grants made available directly to the groups. Under this approach farmers responded to an announcement that grants were available by filling in a simple grant proposal form providing details of the proposed activities. Once the application had been approved by the District Agriculture office and the project management, the funds were transferred directly to their FFS group account. The amount of the grants made available varied according to whether the FFS was farmer-run or extension-run. Farmer-run FFS had a ceiling of \$300 while extension-led FFS (with their higher costs) had a ceiling of \$700. Farmers managed the funds directly and were responsible for the purchase of inputs, stationery, and the payment for the facilitator's transport.

The grant process allows either new interest groups to form for the duration of the study in the FFS and for existing community groups to "sponsor" the organization and implementation of the FFS. Through the grant process, groups have shown a very high level of ownership of the field-school process and many field schools enjoy a high level of matching funds, material inputs provided by the community and participants, and an increasing ability to manage funds and activities on their own. Groups have become independent of extension officers while the extension system has better partners. The process of grants (making work plans, budgets, organizing fields, paying facilitators and managing funds) has also allowed groups to organize themselves to continue on their own beyond the life of the field school: although field school grants are intended to support a group for study purposes for a time-bound period, many field school participants go on to develop

longer-term associations due to their cohesion, trust and joint fund-raising ability developed during the FFS period. The grants thus capitalize groups and catalyze new ways of working together.

Building upon the experience of the grant system, a number of FFS have been financed through an educational revolving loan. The basic difference with this model and the grant system is that the group receives the funds as a loan, rather than as a grant. The loan-requesting group must agree by group contract that they will return the operational costs of the IPPM FFS plus a small amount of interest to the revolving fund.

Focal areas: This is where FFS groups are clustered in one area and grow from a nucleus outwards. Successive FFS have been established in the immediate neighborhood of the original ones to form a cluster. This model has led to: voluntary cross visits between FFS; informal free-time discussions in market places, social areas, etc.; better facilitation and backstopping; positive competition between FFS; pooling of resources and joint activities, e.g., transport for exchange visits, easy follow-up and supervision, marketing, etc.; and easier impact assessment.

Farmer networks: The FFS Networks were formed spontaneously by the farmers themselves, from the grassroots to district level in each of the project districts (in Bungoma district there is one network for all 100 or so FFS, while in Busia there exists a hierarchy of networks at the location, division and district levels), and they are registered with the relevant government department. Formed, on the one hand, to permit the continuity and sustainability of the FFS program beyond the implementation period and, on the other, to bring the FFS groups together for economic purposes, they act as a link to all the FFS in their respective districts. The Network Board members are elected democratically by the FFS members, and so are legitimate representatives of FFS farmers in a range of different fora, such as the poverty eradication committee and subdistrict agricultural committee. Membership is open to all field schools and is voluntary. Modest membership fees are also collected to support the Network. So far almost all FFS are registered with the network. The program organized capacity-building trainings for network officials, on topics such as leadership, organization, financial management, marketing, identification of agri-business opportunities and value adding.

These networks are now starting to take over the role, formerly played by the group facilitators, of assisting the groups to identify and access external service providers/skills, and they already recognize that they can play a significant role in input supplies and produce marketing. They represent a significant development in terms of organizations owned and controlled by poor farmers.

Commercial plots. In addition to the FFS study fields, the FFS farmers have developed “commercial plots.” These are larger fields which the group manages together in order to raise more funds for itself. The funds from these plots are used to fund other activities during and after the study period. This also helps sustain interest in the school, and so promote sustainability. This type of commercial plot has developed in the farmer the attitude of savings, which makes them not overdependent on external funding.

Farmer-facilitated FFS. Farmer-facilitated FFS have proved to be a powerful way of scaling up and scaling out quickly. Since the numbers of extension staff in the field are limited and cost high for transport due to long distances, farmer-facilitated FFS have been an integral part of FFS implementation. Farmers who graduated from an extension-staff-led FFS received brief training (refresher course and facilitation skills) and were then supported to run their own FFS. There is no shortage of volunteers: Farmers are keen to become facilitators, as it enhances their social status. And interestingly, farmer facilitation is considered both to be more effective than extension field staff facilitation (even if the farmer facilitators lack technical skills in areas which they have not covered in their FFS), and to result in more cohesive groups, as these facilitators act as “leading lights” in their communities, attending chiefs’ meetings/gatherings and various development meetings.

Program Impacts

IPPM impacts. Among farmers who have been through the FFS, there is better understanding of biological control measures and the ecosystem. Relating the crop to its ecosystem has enabled farmers to be in a position to differentiate pest and disease damage from moisture or nutritional stress. They have realized that not every insect on the crop is a pest, and not every pest does need a chemical spray. More significantly, farmers have realized that chemical control is not the only option for pest management but that proper crop management practices like timely planting, weeding, correct spacing and soil fertility could be equally good and cheaper practices for controlling pests. Use of the local language and building upon the indigenous knowledge to complement the knowledge of science in the group discussions have helped farmers to understand the ecosystem better and they are therefore able to conserve the agro-biodiversity. Farmers have generated local names for most pests and natural enemies based on the characteristics of the insects; for example, dragonflies are christened helicopters. This has created ownership and confidence for conservation and use of agro-biodiversity. Use of indigenous varieties, especially local vegetables, has also helped conserve the agro-biodiversity.

Through a series of practical field exercises farmers have discovered that the most obvious way to conserve natural enemies is simply to avoid killing them off with pesticides. They have therefore shifted from routine spraying and let the natural enemies do their work. This has led to reduced levels of pesticide usage. The main incentive for conserving this component of ecosystem is the savings farmers make on chemical inputs.

Through experimentation, farmers have found that with the use of organic materials (compost, green manure, liquid manure, and farmyard manure), the biological activity of the soil has been enhanced resulting in improved soil fertility and structure that supported a healthy crop. The greater reliance on organic sources of plant nutrients is reflected in the reduced use of synthetic fertilizers. Between 40 percent and 80 percent of farmers are making and using these organic materials.

Financial impact. For those FFS focusing on crop production, there has been an increase in the yields of the crops under study. This increase in yields has been recorded on the study field, commercial plots and farmers' own farms and the increases vary from about 20 percent to over 100 percent. This has boosted household food security and increased incomes for the farmers. The expertise gained in husbandry has had a multiplier effect in the communities where field schools are found and other farmers have adopted the technologies. The extra production is sold to generate income, which the farmer and/or group members use to build up their savings or further invest to generate more income.

The increased yields, as well as reduced production costs for those farmers switching from pesticide use to IPM, result in substantially increased incomes. Table 3 shows some FFS members' income before and after attending FFS.

For those FFS focusing on poultry production too, results have been positive, with increases in the numbers of batches per year being recorded. This is due to reduction in mortality rates, increase in growth rate due to improved nutrition, housing and reduction in the number of predators.

FFS graduates are increasingly working together after the FFS for their mutual benefit. For example, four FFS in the Busia district have acquired dairy goats for milk production, other FFS continue maintaining larger crop fields, etc. Proceeds from this are used to keep the bank account sound and to address other needs such as paying school fees, medical bills, building decent houses, etc.

Table 3. FFS members' income before and after attending FFS.

| Name of farmer | FFS | Yearly farm income before FFS (KSh) | Yearly income after joining FFS (KSh) |
|-----------------|------------|-------------------------------------|---------------------------------------|
| John Kalayi | Mwinaya | 4,000 | 10,000 |
| Francis Ogutu | Bushitinji | 3,500 | 11,000 |
| Samson Amakobe | Mukombe | 2,000 | 9,000 |
| Wycliffe Namisi | Shitua | 1,000 | 3,400 |
| Peter Kombo | Lwaminyi | 3,500 | 9,000 |
| Amos Odhiambo | Lukhambi | 1,300 | 7,000 |
| Gladys Okoti | Nangombe | 500 | 4,000 |
| Job Omulupi | Undugu | 3,000 | 8,000 |
| Alice Anangwe | Umoja | 6,000 | 15,000 |
| Rofe Nabwayo | Shima | 700 | 16,000 |

Source: Case studies by District Agricultural Office Kakamega and Mary Sambili, FFS Consultant.

Table 4. Impact of FFS on poultry production practices.

| Activity | Farmers practice | Improved practice |
|-----------------|-----------------------|--------------------------------|
| Eggs | 60 per birds per year | 120 per birds per year |
| Mortality | 80-90 % | 20-30 % |
| Growth period | 8 months | 5-6 months |
| Brooding period | 2-3 broodings | 5-6 broodings |
| Predators | 75 % | 10 % |
| Equipment | None | Provided for water and feeding |

Source: Case studies by District Agricultural Office Kakamega and Mary Sambili, FFS Consultant.

Socioeconomic impact. There is little doubt that the FFS result in groups that are cohesive and effective. After FFS the farmers have gone ahead and formed the FFS Networks. These networks are democratic organizations, which are providing a voice to the needs of farmers for agricultural service from the government, NGOs and others. They are increasingly being used by the farmers to link them to the markets, provide market information, information on new technologies, input supply and organizing study tours to research institutions. The networks are also representing the views of relatively poor small-scale farmers in public discussions such as those held during the PRSP process. As mentioned above chairmen of these networks sit on District PRSP boards and subdistrict agricultural committees.

On top of contributing to a better understanding of the ecosystem and a more rational approach to farm management decisions, the rigorous and participatory procedure of conducting AESA leads to building local skills and confidence. There is more interaction among farmers and the facilitators, between farmers and extension officers, and between farmers and research centers. This free sharing of knowledge propels faster learning and tapping of the rich and diverse experiences. Farmers are now taking initiatives to seek solutions to their own problems. They are not only building their own higher-level organizations (the networks) but are also increasingly visiting extension officers, research centers, institutions of learning and international organizations on their own to seek solutions to their constraints. In short, the FFS experience is a means to enable them to build their social capital by creating their own cohesive economic empowerment groups.

Perhaps a good indicator of the success of the program, and the farmers' perception of the value of the FFS, is that there is a waiting list of farmers' groups hoping to be taken on under the program. For example, in 2002, in the Kakamega district, there were some 52 groups which applied to join of which only 26 could be accommodated under the project, given its implementation capacity.

For individual farmers too, both men and women, the FFS process has been empowering. Most of the FFS farmers were considered "nobodies" prior to the FFS. Now, however, they are regarded as role models, opinion leaders and leaders in their communities. For example, in Kenya about 10 FFS graduates have been appointed as assistant chiefs, five have been elected to the local government as councilors, and some have been made Church elders. The Chairmen of the FFS Networks in Busia and Kakamega now sit on the District Poverty Eradication Committees and the subdistrict agricultural committee. Some members have been made chairpersons of the school's board of governors. Some of the FFS graduates have gained formal employment: for example, three members have been appointed farm managers in primary schools, one is now employed by a sugar company, and others employed in community-based organizations.

The FFS experience appears to be particularly empowering for women: as an integral part of the FFS they are expected to make presentations to the group and to engage in discussion, and as a result of the FFS they become more confident, assertive, and are better able to make decisions on behalf of their households. In consequence, they are accorded more respect: they are now allowed to freely air their views in the community and their opinion is respected.

Environmental/health dimension. The FFS focus on IPPM has led to farmers appreciating the importance of agro-ecosystem and hence having the attitude to conserve the environment. The FFS has also provided a study forum for topics such as HIV/AIDS Awareness, malaria control, immunization, nutrition, clean drinking water and pesticide exposure, etc.

Program replicability and upscaling. The program's success has developed a real momentum. Perhaps the most impressive of this momentum is that, with increased farmer demand for FFS in program areas, some farmers are taking the initiative to start up FFS themselves: to date about 30 self-funded FFS have emerged. Second, a number of other donors and NGOs have adopted the approach as a basis for the implementation of their projects. In addition to IFAD and FAO, UNDP, USAID, EU, DFID and Rockefeller Foundation have also funded FFS initiatives, while ILRI and KARI too are implementing FFS activities. A wide range of NGOs and local institutions in the countries are also supporting FFS on smaller and location-specific scales: these include Action Aid, Plan International, CREADIS (Community Research in Environment and Development Initiatives), Catholic church, Anglican church, Kenya Aids Intervention Prevention Project (KAIPP), etc. Third, and ultimately most significant, the Ministry of Agriculture has taken up the FFS approach within the national extension program, and is already actively supporting it in a number of districts.

Lessons Learned

The most important lessons learned are:

- a) The FFS is an effective tool to encourage communities to validate and adapt improved technologies to local conditions, improve rural food security and income generation, and empower farmers to find solutions to their problems.
- b) The FFS approach can be successfully used and adapted to improve skills and knowledge of farmers for a very wide range of crop/livestock/natural resource management enterprises.

- c) The direct management of the funds of the FFS by farmers' groups, in particular the payment for the provision of the extension services, has substantially improved the performance of extension delivery and accountability of extension providers. It promotes a demand-driven extension system in which farmers are empowered to choose the extension activities that are most relevant for them and their communities.
- d) The strategy used by the program to promote farmer-led FFS (farmers as facilitators) has allowed a large number of farmers to benefit. If the program had been built only on extension staff to facilitate FFS, the number of farmers who would have been able to participate would have been less. Investing in skill development and networking of farmer-facilitators allows extension workers to reach many more farmers compared to most other extension approaches.
- e) FFS have empowered communities and raised their profile at district level, as has been demonstrated by the creation of strong and cohesive FFS networks and associations. These FFS networks emerged without external support. They have a big potential in acting as a platform for community-based extension activities, and for addressing marketing and policy issues. Social capital development is one area very difficult to assess in terms of economic impact but it is certainly one of the most important areas for long-term sustainability, replicability and continued returns on investment.
- f) The majority in the gender balance in FFS have proven to be female. In Kenya, on average, about 70 percent of FFS participants in the country are female. Experiences suggest that the approach is highly appreciated by both sexes but women seem to especially value the approach due to the practical, field-based learning focus and the social value of the FFS groups.

Challenges and Way Forward for FFS in Kenya

Through the efforts of the IFAD/FAO IPPM program a model for a self-financed FFS system has been developed and tested. A new phase of the program will start in 2005, and this will seek to develop the East African FFS model still further. A large majority of the FFS funds (for UNDP- as well as the IFAD-funded FFS) will be made available to the groups using the cost-recovery approach, through which groups borrow the amount necessary for running their FFS and repay the amounts after the FFS cycle. This is an encouraging development to reduce the costs in FFS implementation, but it poses a major challenge in terms of putting in place the institutional architecture needed for managing such revolving funds.

While integrated production and pest management have been a good entry point, the FFS need to respond in other areas of farmer demand, especially in marketing, savings and credit. These topics would be included within the range of those to be covered by the FFS. In addition, through the training of the facilitators, the FFS need to become increasingly focused on the issue of HIV/AIDS and on appropriate mitigation measures.

Monitoring and evaluation of FFS impacts and achievements have been poor by all FFS initiatives in the countries. There is a need for development of M&E frameworks and tools for FFS, and for more rigorous analyses of issues such as cost effectiveness and sustainability, for developing a greater understanding of the benefits of empowerment, and for a more thorough assessment of the impacts of FFS on rural food security and poverty reduction.

The farmer demand for FFS is increasing rapidly, and there is presently only limited capacity to respond to this demand. There is therefore a need to support the development of an FFS-related skill base beyond the initial program areas and program partners, to establish a national institutional capacity for FFS training and implementation and to ensure a quality control and coordination of FFS activities in each of the participating countries.

As the interest for FFS expands, there is a rapidly growing demand for literature on FFS, facilitators' manuals and FFS curricula on various topics and enterprises.

CONCLUSION

FFS can contribute significantly to enhancing food security at household and community level. The FFS process is flexible in terms of topics and is designed as a structured nonformal learning approach to build farmer skills and organization. The methodology also makes the farmers better clients for extension and research. Farmers appreciate the demand-driven extension approach and the methodology is becoming more and more popular with the farming community and other stakeholders in the project area and the surrounding countries. Members of extension staff involved in FFS develop a sense of responsibility and get more job satisfaction.

LITERATURE CITED

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ANNEX 1

Acronyms

| | | |
|---------|---|---|
| AESA | - | Agro Ecosystem Analysis |
| CREADIS | - | Community Research in Environment and Development Initiatives |
| DAO | - | District Agriculture Office |
| DFID | - | Department for International Development, UK |
| EU | - | European Union |
| FAO | - | Food and Agriculture Organisation of United Nations |
| FFS | - | Farmer Field School |
| IFAD | - | International Fund for Agricultural development |
| ILRI | - | International Livestock Research Institute |
| IPM | - | Integrated Pest Management |
| IPPM | - | Integrated Production and Pest Management |
| KAIPP | - | Kenya Aids Intervention Prevention Project |
| KARI | - | Kenya Agriculture Research Institute |
| M & E | - | Monitoring and Evaluation |
| NGO | - | Nongovernmental Organization |
| PFI | - | Promotion of Farmer Innovation |
| PRSP | - | Poverty Reduction Strategy Process |
| SPFS | - | Special Program for Food Security |
| UNDP | - | United Nations Development Program |
| USAID | - | United States Agency for International Development |

Chapter 6

Examples of Bright Spots

INTRODUCTION

A Bright Spot, or Community Success, was defined as a community or a group of individuals that achieves higher food and environmental security, through improvements in (among others) land and water management (Noble et al. 2005, this volume). Bright Spots are potentially sustainable, and levels of natural resource capital are above ecological and economic thresholds, in contrast to unimproved situations.

To go beyond these abstract definitions, we illustrate in this chapter what is meant by a Bright Spot with a number of concrete examples. Some of these were discussed more in detail in previous chapters.

CALL FOR CONTRIBUTIONS

Bright Spots come in an infinite variety of sizes, improvements made, drivers and conditions. Please use your imagination and memory. You probably can recall some cases where you have actually visited a Bright Spot already. If you do recognize one, please consider sending us information on that to: (b.mati@cgiar.org). We hope this Working Paper has encouraged you to find examples from your country.

At the end of this chapter, we included the questionnaire that was used to obtain the information presented in chapter 2 by Noble et al., and you are encouraged to use it as a guideline for your own research.

ACKNOWLEDGEMENTS

The attractive format for the summaries was proposed by Dr. S. Haggblade, IFPRI, and was used during the African Successes Conference 2003 to quickly characterize commodity successes. We thank the Comprehensive Assessment for allowing us the use of the Bright Spot database. Particularly our “thank you and please continue” go to the hundreds or thousands of initiators and inspirators of the real Bright Spots whose names are not spelled out here. To you the future!

CASE STUDY SUMMARY - 1

Bright Spot: *Ng'uuru Gakirwe Water Project, Tharaka, Kenya.*

Innovation: *Production, processing, packaging and export of high-value herbs in niche markets abroad.*

Further Information: *Mati and Penning de Vries, 2005 (this volume).*

Nature of the Success?

The Ng'uuru Gakirwe Water Project is a smallholder, piped, gravity-fed sprinkler irrigation scheme, covering 60 km² and accommodating 430 farmers in Tharaka, Kenya.



Irrigating chamomile



A crop of irrigated carcade

Why Is It Considered a Success?

- Production of high-value organic herbs (carcade, chamomile and lemongrass), fruits and vegetables, accompanied by processing, packaging and sale in niche and export markets abroad.
- There is a factory within the scheme for processing and packaging the herbs.
- The factory is run by farmers through the Meru Herbs Company.
- Positive impacts on food security and poverty reduction in a famine-prone area.
- High adoption rates and simplicity of the approach.

Motors of Change

- Availability of water (originally it had been planned as a drinking water project but farmers converted it to an irrigation project).
- Identification of niche markets abroad.

- Support from the sponsor (Catholic Church) in facilitating expansion of the irrigation scheme and export marketing.
- Availability of a factory within the scheme for processing and value adding.
- Simplicity in the processing systems, enabling local people to handle factory production.
- Highly motivated farmers due to profits resulting from the sale of the herbs and food security achieved.

Why Did It Stall?

- It never stalled. Demand for irrigation by farmers outside the scheme has been growing, but the limit is water shortage.

Aggregate Impact

Growth and Scale

- Rapid expansion from 135 farmers in 1988 to over 430 farmers in 2000.
- Average incomes raised from almost zero to over \$300 per farmer per month.
- Although only 43 farmers were certified as organic growers, many others adopting the growing of herbs.
- Improved living standards and food security compared to the period before the irrigation scheme.

Equity

- Most farmers rely on the Meru Herbs Company to purchase their products, and when there is a glut, produce goes to waste.
- Marketing of non-herb products, especially vegetables is frustrated by poor prices offered by middlemen.

Sustainability

- Demand for Meru Herbs is growing with new orders from Germany, Belgium and Japan.
- The practice of organic farming is sustainable in maintaining a healthy plant environment since organic manures are easily available (farmers are only required to grow herbs organically, other products are grown normally).
- It is possible for the processing factory to be run by the farmers themselves as currently all the employees are local persons.

- It is not clear whether farmers can, on their own, manage to solicit for export markets and there is a heavy reliance on the sponsor for this.

Lessons for Building Future Success

- Identification of high-value products/crops that are easily adaptable to local conditions but that require simple methods of production, processing and handling.
- Critical mass in production to enable fulfillment of overseas orders.
- Maintenance of high hygienic standards as set by buyers and importers.
- Financial support for capital investment in the irrigation scheme, factory and marketing.
- Training of farmers and regular follow-up to maintain standards.

Dynamics and Drivers of Change

The Ng'uuru Gakirwe Water Project

| | Period 1 Project initiation | Period 2 Current situation |
|-------------------|---|--|
| Timing | 1988-2000 | 2000 onward |
| Key actors | <ul style="list-style-type: none"> • Developed in three phases, starting in 1988 with Phase 1, with 135 connections (i.e., 135 farm units) • Phase 2 developed during 1992-95, with 135 connections • Phase 3 during 1996-2000 with 170 connections | <ul style="list-style-type: none"> • Meru Herbs, the company that buys the herbs from farmers • Diocese of Meru facilitates marketing linkages for export produce |
| Motors of change | <ul style="list-style-type: none"> • Availability of water and climate • Funding from Italy and the European Fund (\$750,000), as a loan to farmers, solicited by the Catholic Church (Diocese of Meru) • Introduction of marketable products • Stable prices and stable market | <ul style="list-style-type: none"> • The loan being repaid by farmers as water charges at KSh1250 (about \$16) per year • Average incomes raised from almost zero to over \$300 per month per farmer |
| Beneficiaries | <ul style="list-style-type: none"> • Smallholder farmers benefiting from food security and increased incomes | <ul style="list-style-type: none"> • A total of 430 farmers in the scheme • 43 farmers certified as organic farmers |
| Production growth | <ul style="list-style-type: none"> • From recipients of relief food to food self-sufficiency • Export crops introduced | <ul style="list-style-type: none"> • Production of herbs increased from none to about 100 kg per month of chamomile and 2,000 kg of carcade |
| Impact | <ul style="list-style-type: none"> • Improved housing, food and family incomes | <ul style="list-style-type: none"> • Expansion of irrigated land for herbs and other crops |



Carcade and lemongrass



Irrigated maize for food security

CASE STUDY SUMMARY - 2

Bright Spot: *Mukuria-Kyambogo Irrigation Scheme, Tri-Hills Horticultural S.H.G. and Homegrown Ltd. in Timau, Meru Central, Kenya.*

Innovation: *Partnerships between large commercial farms and smallholder outgrowers.*

Further Information: *Mati and Penning de Vries 2005 (this volume).*

Nature of the Success?

The Mukuria-Kyambogo Group Irrigation Scheme is a gravity-fed sprinkler scheme with 15 farmers, while the neighboring Tri-Hills Horticultural Self Help Group, also sprinkler, has 90 smallholder farmers. Homegrown Ltd. is a large-scale commercial farm. All three specialize in export of fresh horticultural produce to Europe.



String beans on a commercial farm



Garden peas on a smallholder farm

Why Is It Considered a Success?

- Successful partnerships between large commercial farms and smallholder outgrowers have enabled smallholder farmers to fulfill the EUREP-GAP export protocols and thus access European Union fresh-produce markets.
- Adoption is 100 percent among the smallholder farmers and demand is growing.
- Has removed marketing problems (including problems of middlemen) from smallholder farmers.

Motors of Change

- Shortage of land for the large commercial farms forcing them to turn to smallholders to meet their export orders for fresh produce.
- High profit margins earned by smallholder farmers are a motivation. For example, one farmer earns \$1,200 per month.
- Competition between the different large commercial farms for the smallholder outgrowers ensures farmers are not overexploited.
- The climate is just right for the three major crops, snowpea, garden pea and sugar snap.
- The stringent EUREP-GAP protocols mean that the commercial farms have to assist smallholders especially through training, for the partnerships to be productive.

Why Did It Stall?

- It stalls if smallholder farmers do not implement laid down regulations and procedure but they are easily found out, and appropriate action taken, e.g., MoU canceled.
- Sometimes, the large commercial farm loses an export order just when the crop is ready for harvest among smallholders (but now they have policies that protect smallholder farmers in case of such an eventuality).

Aggregate Impact

Growth and Scale

- Smallholder outgrowers contribute 12.5 percent of total production for Homegrown Ltd., a large commercial exporter, and the company would like to see this proportion increase to 50 percent.
- Before 2000, Tri Hills SHG had 20 members growing local vegetables such as potato, carrot and cabbages as individuals. Now there are 90 members growing export fresh vegetables.
- The Mukuria-Kyambogo Group Irrigation Scheme started in 1994 by 15 farmers, with a loan of KSh720,000. It has long paid back the loan and from 2000, they started outgrowing for Homegrown as individuals.

Equity

- Most smallholders get credit from the commercial farms as inputs.

Sustainability

- Depends on some level of investment by the commercial farms into capacity building of the smallholders.

- Also depends on international markets and pricing, and is sensitive to macro-economics, e.g., foreign exchange rates.
- Building of trust between the parties concerned.

Lessons for Building Future Success

- Developing strong MoUs that ensure both parties are diligent in meeting their obligations.
- Facilitation in training and sharing of information between the commercial farms and smallholders.
- High literacy rates among the smallholders to be able to keep the necessary records and read instructions manuals.
- Modern communication such as mobile telephones enables the exporter and the smallholder to communicate well, e.g., send instructions, or make requests for specific orders of produce, which is subsequently harvested on demand, thus avoiding wastage.
- Availability of quality inputs and stable markets.

Dynamics and Drivers of Change

Developments in Key Aspects of This Example.

| | Period 1 Project initialization | Period 2 Current situation |
|-------------------|---|--|
| Timing | Before 2000 | After 2000 |
| Key actors | <ul style="list-style-type: none"> • Large commercial exporters including Sunfresh, Mastermind, Greenland, Sunripe, Everest, East African Growers, VegPro, Vitacress and Homegrown approach smallholder outgrowers • Extension services | <ul style="list-style-type: none"> • Large commercial exporters require extra produce to meet orders |
| Motors of change | <ul style="list-style-type: none"> • Demand for fresh horticultural produce in EU markets • Good prices from export of produce • Smallholders eager to improve their incomes | <ul style="list-style-type: none"> • Smallholder outgrowers eager to earn incomes • Availability of stable markets for smallholders • EUREP-GAP protocols requiring smallholders to upgrade their practices |
| Beneficiaries | <ul style="list-style-type: none"> • Smallholder farmers • Large-scale commercial farms | <ul style="list-style-type: none"> • Smallholder farmers • Large-scale commercial farms |
| Production growth | | <ul style="list-style-type: none"> • Productivity from the outgrowers has been growing, with some getting as much as 100 kg per day of garden pea, fetching about \$0.45 kg⁻¹ |
| Impact | | <ul style="list-style-type: none"> • Improved food security • Wealth creation • Improved livelihoods • Environmental health |



Members of the Tri-Hills SHG build their shed



Records on-farm under smallholder crop

CASE STUDY SUMMARY - 3

Bright Spot: *Lare Water Harvesting Project, Nakuru, Kenya.*

Innovation: *Water harvesting from road surfaces into small earthen pans and its utilization for supplementary irrigation, accompanied by high rates of adoption.*

Further Information: *Mati and Penning de Vries, 2005 (this volume).*

Nature of the Success?

Water harvesting from roads into earthen pans for supplemental irrigation. Rapid adoption of the innovation reaching 150 percent per year, with subsequent improvement in community incomes, food security and access to water.



An earthen pan on Mr. Kamau's farm



Mr. Kamau irrigates a tree nursery with pan water

Why Is It Considered a Success?

- Before the project, about 70 percent of all households experienced serious water-shortage problems, while crop failures from prolonged dry spells were common.
- Rainwater harvesting interventions have transformed agriculture, increased food security and reduced poverty.
- Household health has been improved due to better nutrition and clean drinking water (they have adopted water-treatment techniques, as drinking water is obtained from the pans).
- The pace of adoption of the innovations has been impressive. Starting with about 400 pans in 1998, there are now about 4,000 pans, a tenfold increase in just 6 years.

Motors of Change

- The problem of water shortages, especially for drinking, drove farmers to innovate.
- Favorable physical conditions (soils that allow pans to be self-sealing).
- Technology transfer from researchers and extension services encouraged the local people to design and construct the pans themselves.
- Farmers were trained in roof water harvesting, runoff water harvesting and simple water-treatment methods.
- Access to markets as Nakuru town is within reach while the Njoro Canning factory also buys some of the produce.

Why Did It Stall?

- It never stalled. Demand for water harvesting has been growing, and expansion taking place all the time.

Aggregate Impact

Growth and Scale

- In 1998, about 409 households had runoff-harvesting systems and these increased to about 1,030 households by the end of 1999, an increase of about 150 percent. By August 2004, over 4,000 households had water-harvesting systems.
- Farm family incomes have increased from a negligible amount to about \$2,000 to \$6,000 per year.

- Family food security has stabilized regardless of adverse weather as the farmers now grow food crops such as maize, bean, potato and fruits throughout the year.
- Improved standards of living with better housing, availability of drinking water, including livestock water while water treatment has resulted in improved health.

Equity

- The farmers grow a wide variety of marketable produce (leek, baby corn, kale, onion, fruits) and there is no critical mass of a specific product, for which large-scale production and marketing could really bring in stable incomes.
- Lack of credit to expand and enable motorized pumping was cited as a major constraint.

Sustainability

- The innovation is rooted in farmers' own labor and initiative and requires little external input; hence it has proved quite sustainable.
- Access to markets is assured due to the proximity of the Nakuru town, the Njoro Canning factory and exporters who visit the area to buy the produce.
- Sometimes, there are low prices for vegetables when there is a glut in production from other areas; hence, it is necessary to identify crops which Lare can produce in critical mass.

Lessons for Building Future Success

- Financial support and credit for farmers who want to commercialize production.
- Training of farmers and regular follow-up, especially those whose pans have a seepage problem.
- Identification of high-value products/crops, which are easily adaptable to local conditions, but which require simple methods of production, processing and handling.
- Critical mass in production of lesser marketable produce.

Dynamics and Drivers of Change

The Lare Water Harvesting Project

| | Period 1 Project initiation | Period 2 Current situation |
|-------------------|--|--|
| Timing | 1988-1999 | 1999 onward |
| Key actors | <ul style="list-style-type: none"> Starting with about 409 households these increased to about 1,030 households with runoff-harvesting systems by the end of 1999, an increase of about 150% | <ul style="list-style-type: none"> Adoption continued to grow; about 4,000 pans excavated by 2004 Farmers trained in roof water harvesting, runoff water harvesting and simple water-treatment methods |
| Motors of change | <ul style="list-style-type: none"> Water shortages and prolonged dry spells Favorable physical conditions Technology transfer Local people design and construct the pans themselves Farmer training | <ul style="list-style-type: none"> Access to markets The drought of 2000 teaching farmers a lesson Sustained interest by other stakeholders |
| Beneficiaries | <ul style="list-style-type: none"> Smallholder farmers | <ul style="list-style-type: none"> A total of 4,000 farmers benefiting from water harvesting Exporters Processing factories |
| Production growth | <ul style="list-style-type: none"> From marginal production of food crops to diversification in marketable produce | <ul style="list-style-type: none"> Increase of incomes from a negligible amount to about \$2,000-\$6,000 per annum |
| Impact | <ul style="list-style-type: none"> From recipients of relief food to food self-sufficiency | <ul style="list-style-type: none"> Improved health Water available for drinking and for livestock Improved housing, food and family incomes |



Showing the inlet from the road to the pan at Lare



A crop of irrigated leeks at Lare

CASE STUDY SUMMARY - 4

Bright Spot: *Spring protection: Isiolo River Water Users Association (IRWUA), Kenya.*

Innovation: *Spring protection and conservation of riparian lands, leading to stabilized river flows, enhanced dry-season irrigation, environmental conservation and resolution of water conflicts.*

Further Information: *Mati and Penning de Vries 2005 (this volume).*

Nature of the Success?

Spring protection has succeeded in solving a multiplicity of problems affecting the Isiolo river regime, its hydrology and ecosystems and positively influencing the livelihoods of the local people by improving access to water, food security and health, and combating poverty and resolving water conflicts.



An unprotected spring in Isiolo



The protected Rugusu spring

Why Is It Considered a Success?

- The Rugusu stream is one of seven springs that feed into the Isiolo river, which was previously ephemeral. The protection of its source has stabilized the flows of the Isiolo river behind the confluence, and now it flows throughout the year.
- The water flows in the furrow at Mashambani have also increased allowing farmers to irrigate their crops even during the critical dry season.
- The positive impacts have been realized within a relatively short time, allowing irrigation of high-value vegetables, environmental recovery, conflict resolution and water availability (watering livestock, water quality, washing dhobi).

Motors of Change

- Problems associated with water conflicts, especially between irrigators and pastoralists have driven the local community to seek a group approach, by electing a caretaker committee, now the Isiolo River Water Users Association (IRWUA).
- Community involvement, training and sensitization have played a big role in the community owning the process, the success and, therefore, project implementation.
- Simplicity of the spring protection approach, and well-organized management structures.
- Some level of facilitation by CDTF especially in capacity building and infrastructural development.

Why Did It Stall?

- Lack of finances to protect the other six springs from 1996 when the Rugusu spring was rehabilitated. Demand for water for irrigation and livestock has been growing.

Aggregate Impact

Growth and Scale

- Before the spring protection in 1996, the Isiolo river had been reduced to an ephemeral stream, drying out to a trickle during the dry season. This had resulted in water shortages in the Isiolo town, while downstream water users could not get water for irrigation and pastoralists would lack water for their animals.
- Interventions involved first moving out the farmers from the riparian land around the spring and along the length of the Rugusu stream. It involved a lot of training and sensitization so that local people would not allow their livestock into the spring area, which was fenced for an area of just 5 hectares. The riparian land was then re-afforested. Within 2 years, the spring became perennial. A series of five water offtakes were also installed, three of them using hydram pumps.
- Farmers using the water for irrigation downstream earn about \$2,000 to \$6,000 per year.
- Food security, environmental conservation, and water availability even for pastoralists downstream have been achieved, reducing water conflicts.

Equity

- Marketing of vegetables and other produce is a big problem as the Isiolo town cannot provide an adequate clientele while markets in Nairobi and Mombasa are too far away and flooded with produce from larger irrigation schemes.

- There are problems of farmer exploitation by middlemen, and uncoordinated production so that there is no critical mass for a specific product.
- There is still a lot of water wasted in unnecessary seepage due to poor canal lining and siltation.

Sustainability

- Spring protection is a long-term intervention which should remain sustainable as long as the community maintains discipline.
- The IRWUA is well organized, registered and capable of resource mobilization and is structured to be inclusive of water users upstream and downstream.
- Demand for water for irrigation and livestock watering is growing as large numbers of livestock now inhabit Isiolo, making it necessary to protect more springs.
- The IRWUA requires operational funds to pay for services and further expansion of its activities. Resource mobilization requires strengthening.

Lessons for Building Future Success

- Spring and riverbank protection is a viable way to solve water shortage problems, stabilizing dry-season flows for irrigation that, in turn, can lead to improved food security and poverty reduction, while enabling environmental recovery.
- Spring protection that takes a holistic approach to other sectors of community livelihoods will offer more tangible impacts.
- The role of a strong community-based organization to spearhead the process and retain good management is necessary for sustainability.
- Marketing of the produce accruing from the activities is important in driving the desired economic growth and wealth creation among the beneficiaries.
- Training of farmers and regular maintenance are necessary.

Dynamics and Drivers of Change

The Lare Water-Harvesting Project.

| | Period 1 Project initiation | Period 2 Current situation |
|-------------------|---|--|
| Timing | Before 1996 | After 1996 |
| Key actors | <ul style="list-style-type: none"> • The Isiolo river reduced to an ephemeral stream, drying out to a trickle during the dry season • Water conflicts between irrigators and pastoralists • Formation of a Water Caretaker Committee in 1995 | <ul style="list-style-type: none"> • Operationalizing Isiolo River Water Users Association (IRWUA) • Farmers using the water for irrigation downstream earning about \$2,000 to \$6,000 per year • Food security, environmental conservation, water availability for pastoralists downstream, reduced water conflicts |
| Motors of change | <ul style="list-style-type: none"> • Water conflicts, especially between irrigators and pastoralists • Some level of facilitation by CDTF especially in capacity building and infrastructural development | <ul style="list-style-type: none"> • Election of a caretaker committee (now IRWUA) • Community involvement, training and sensitization • Well-organized management structures |
| Beneficiaries | <ul style="list-style-type: none"> • All water users, irrigators, pastoralists and households | <ul style="list-style-type: none"> • Smallholder farmers benefiting from irrigation |
| Production growth | <ul style="list-style-type: none"> • From degraded catchment and riparian lands to well-conserved and stabilized river hydrology | <ul style="list-style-type: none"> • From negligible production of vegetables to increased production of up to 8 t ha⁻¹ of tomato |
| Impact | <ul style="list-style-type: none"> • Spring protected, environmental protection and stabilization of river flow | <ul style="list-style-type: none"> • Improved water availability, food security, farm incomes and environmental recovery |



Improved livestock watering at Rugusu spring



Irrigated fodder at Mashambani, Isiolo

CASE STUDY SUMMARY - 5

Bright Spot: *Lari-Wendani Smallholder Irrigation Scheme, Nakuru, Kenya.*

Innovation: *Sustainable management of the community-based irrigation scheme by the farmers themselves.*

Further Information: *Mati and Penning de Vries, 2005 (this volume).*

Nature of the Success?

Management of the irrigation scheme by the farmers themselves with few internal conflicts, organized water-sharing schedules during dry spells and good maintenance of the irrigation infrastructure.



Water Committee members of Lari-Wendani



Maize crop with and without supplemental irrigation

Why Is It Considered a Success?

- The area used to be semiarid and people very poor, but once the irrigation scheme was installed by the government, they took over the running of the scheme, with few reported internal conflicts.
- Farmers self-regulate in rationing water during the dry season to allow some to join the main river, which is ephemeral although their own source of water is perennial.
- Improved food security and incomes to the local people.
- Lari-Wendani is the main supplier of vegetables to the Nakuru town.

Motors of Change

- The farmers are settlers from the wetter Kiambu district, and they found it impossible to survive under the dry conditions in the area. They thus requested the Ministry of Agriculture for an irrigation scheme.

- The area is rather cut off due to poor roads; hence the need for farmers to be self-reliant and self-supporting, especially in maintaining the irrigation infrastructure.
- The community is rather homogenous, having emigrated from the same area.

Why Did It Stall?

- It has stalled sometimes due to poor prices offered by middlemen.

Aggregate Impact

Growth and Scale

- The scheme was started in 1986 with 94 farmers.
- It covers 80 hectares and water is drawn from the Igwamiti river, which is a small perennial stream.
- It is a gravity-fed, furrow-based system.
- The farmers grow tomato, onion, potato and kale.

Equity

- All the farmers are members of the scheme and participate fully in group activities.

Sustainability

- Sharing of water during the dry season with minimal conflicts and is supervised by the Committee.
- Local resource mobilization and transparency of the office bearers.
- The original design of the water-distribution infrastructure is well laid out and there are minimal breakages or losses, requiring little maintenance.
- The community is homogenous and rather cut off from other settlements calling for some level of self-reliance.

Lessons for Building Future Success

- The community was involved from the beginning in project identification and implementation. Thus they feel a responsibility towards its sustainability.
- Allowing the community members to share responsibilities such as water allocation, e.g., the water rationing is done by the farmers themselves.

- Leaving in place engineering infrastructure that works with minimal problems.
- Irrigation is the lifeline of these farmers; they must make it work.
- A strong involvement of youth.

Dynamics and Drivers of Change

The Lari-Wendani Irrigation Scheme

| | Period 1 Project initiation | Period 2 Current situation |
|-------------------|--|---|
| Timing | Before 1986 | 1986 onward |
| Key actors | <ul style="list-style-type: none"> • Lari-Wendani irrigation scheme started in 1986 as a group scheme, through technical assistance by the Ministry of Agriculture • Ninety-four founder members • Covers 80 hectares and water drawn from the Igwamiti river | <ul style="list-style-type: none"> • The official list still has 94 members but the actual number has grown • The scheme committee serving as caretaker of water allocation and resolution of conflicts |
| Motors of change | <ul style="list-style-type: none"> • Prolonged dry spells in the area leaving farmers food insecure and vulnerable • Request by the farmers to the Ministry of Agriculture for an irrigation scheme | <ul style="list-style-type: none"> • The area rather cut off due to poor roads; hence the need for farmers to be self-reliant and self-supporting, especially in maintaining the irrigation infrastructure • The Water Committee is committed and farmers encouraged to self-regulate as they share water |
| Beneficiaries | <ul style="list-style-type: none"> • Smallholder farmers benefiting from growing high-value irrigated crops | <ul style="list-style-type: none"> • Over 100 farmers benefiting |
| Production growth | <ul style="list-style-type: none"> • In 1986, all the farmers were poor and food insecure | <ul style="list-style-type: none"> • Farmers now earning money from the sale of produce |
| Impact | | <ul style="list-style-type: none"> • Improved food, family incomes, housing and access to education for the children |



Protected intake at the Igwamiti river



An irrigated field at the Lari-Wendani scheme

Box 1. Africa Centre for Holistic Management

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The Wange Community of northwest Zimbabwe typify most of the problems that plague rural communities in Africa, namely, desertifying land, drying up of rivers, boreholes and dams, approximately 80,000 people in poverty, rampant AIDS, constantly failing crops, dwindling livestock, the exodus of young people, rampant poaching of nearby timber and wildlife in state lands and more in a country experiencing violence, corruption and economic meltdown to an alarming degree. The Africa Centre is a local nonprofit organization established by Zimbabweans to reverse this situation meaningfully over time starting in their own community but extending assistance throughout English-speaking Africa. All of the local problems are being addressed in a realistic manner through local drive and commitment.

This is an ongoing project as neither reversing land degradation nor achieving lasting social change can be achieved through projects of short duration—no matter how well intended. For this reason the project is constantly referred to as a 100-year project. The project is based upon achieving the desired reversal of land degradation and all of its many symptoms—droughts, floods, poverty, social breakdown, violence, abuse of women and children, etc., through empowering people to take charge of their lives and destiny by using a holistic decision-making framework developed by the Zimbabwean founder of the project.

The overall achievements to date are that the project is an island of calm in the chaos of today's Zimbabwe. Over 2,000 village members have been trained through the conservation projects (grazing, home gardens, women's banks, wildlife management). War veterans are being trained as Game Scouts and actively catch poachers while sharing income from organized wildlife safari hunting. All the Chiefs of the vast Wange Communal Lands are Trustees and commit significant time and energy to the governance of the Africa Centre. To date 24 women's banks have been formed by over 500 women. While many people—black and white—have been losing land, four ranches have been added to the communities' piece of privately held land to enable the Africa Centre to now form a College of Agriculture, Wildlife and Conservation Management. The total land now managed by the Africa Centre amounts to 20,000 acres. This land held by the Trustees for the good of the community is dramatically improving with vast increases in ground cover, grass for animals and wildlife, increased water in boreholes and with one of its main rivers close to, once more, becoming perennial in flow. Wildlife has increased tenfold or more on the project land.

Substantial training and coaching have been provided to the community on permaculture techniques and on grazing planning (to reverse land degradation and restore water to rivers and boreholes). Steps are being taken to establish a monitoring program to formally capture the gains being made socially, environmentally and economically in

Box 1—Continued

the community in a comprehensive manner. Due to the holistic grazing planning implemented by the Africa Centre on their land, a substantial number of the community's livestock was saved from death during recent poor seasons. Where the project land had previously been seriously deteriorating and was considered "overstocked" with 100 heads of cattle, the Africa Centre is currently running a herd of over 600 cattle, goats, pigs, donkeys and horses with dramatic benefit to the land. The impact of the project at the watershed level is best illustrated with pictures taken on the same day. Plate 1 shows a dried-up riverbed devoid of any base flow in the dry season and riparian vegetation. Plate 2 shows the community's Dimbangombe river where the Africa Centre is now showing the entire community how to revitalize the land and wildlife through managing land with livestock without the traditional role of fire. A few years ago, these scenes would have been similar.



Degraded riverbed common to the area.



Restored river and riparian zone.

The Africa Centre's land so far impacted by the project is 20,000 acres which is but a small percentage of the over one million acres of the Wange communal lands, but it is their example and learning site. Now the work is being gradually extended to the areas of the two closest Chiefs, Shana and Mvutu, whose people are currently receiving education, training and coaching. Rivers originating in the Wange communal lands are often prone to flash flooding and are dry during the long winter dry season. The example of a rehabilitated river presented in plate 2 represents "new water" in that it was not previously flowing into the river but was being lost largely to soil surface evaporation. Such soil surface evaporation is being reduced by the people through the control of fires, while increasing livestock numbers but using the technique of holistic grazing planning developed by the Chairman of the Africa Centre and now being used in a number of countries worldwide.

There are now approximately 500 women participating in the Africa Centre's women's micro-lending banks. These are in their fourth year of operation and continue to maintain 100 percent payback rate with most women reporting significant and encouraging change in their households and food security. In addition, through its

Box 1—Continued

efforts the Africa Centre is providing employment to 100 or more people as well as injecting many thousands of dollars into the community annually. The area of land impacted is currently 20,000 acres reasonably impacted, probably over 100 acres of improved small gardens scattered as well as gardens utilizing drip irrigation kits (provided by USAID with distribution, training and administration provided by the Africa Centre staff).

Establishing deep trust and acceptance take time and patience. This important aspect is not encouraged by 3-5 year projects, which demand quick and quantifiable results. The process must be driven by local people, and developing a team of community leaders with the commitment and skills takes time.

Box 2. Bonganyilli-Dugu-Song Agrodiversity and Biodiversity Project in Ghana

Olufunke Cofie, IWMI, Accra, Ghana

The United Nations University project on People Land Management and Environmental Change (PLEC) initiated various activities in Ghana in 1993 with the aim of identifying “those aspects of farmer land usage that appear to be particularly effective for conservation of agrodiversity, and involved demonstration of sustainable management of agrodiversity at various study sites, in a process of their development into ‘demonstration sites’ to foster agrodiversity conservation, analysis and dissemination.” One of the areas in Ghana was Bonganyilli-Dugu-Song of Tolon-Kumbugu district, Northern Region.

*The vegetation of the area is guinea savanna, which consists of natural grasslands with scattered trees including sheabutter (*Butyrospermum paradoxum*) and dawadawa (*Parkia clappertoniana*). The major threats to this vegetation are bush fires (to clear for farming, hunting, etc.) and grazing by livestock. Temperatures are high and average annual rainfall ranges from 1,000 to 1,300 mm and occurs over a 140–190 day period. There is a prolonged dry period and frequent occurrence of droughts. The soils are predominantly savanna ochrosols and lixisols of the Tekyiman-Tampu association. They are sandy or silty and are underlain by an indurate laterite layer and characteristically have low moisture-retention attributes. These soils are not particularly fertile due to low organic matter contents. The relief of the area is gentle rolling/undulating lowland. The inhabitants are predominantly Dagombas, the major tribe in the Northern region and their main occupation is subsistence agriculture. The population of the Bonganyilli-Dugu-Song area is over 2,000 and over 90 percent of these inhabitants are involved in farming. Birth rates are still high, above five children per woman. Approximately*

Box 2—Continued

70 percent or more of the inhabitants are illiterate. Most of the people who are educated can only read Dagbani, the local language. Though some portions of the terrain are marshy and waterlogged during the rainy season, there is no notable river and the only water body which serves about ten or more communities is a dug out. More than two-thirds of the total land surface area is under cultivation.

Before PLEC's arrival, the environment was virtually bare with very few trees scattered throughout the area. The soils were infertile as a result of continuous cultivation and maize (major staple) yields were as low as 125–250 kg ha⁻¹. PLEC's arrival brought much relief to the inhabitants. They were taught and encouraged to carry out soil- and water-conservation practices including stone bunding, water harvesting, composting and tree planting. Tree nurseries were developed with the communities. Trees that were planted include neem, acacia and mango. Many of these trees established will serve as woodlots for fuelwood. Inhabitants will also derive poles/sticks from the woodlots to support yam plants.



Stone bunding in Dugu-Song



Afforestation in Dugu-Song

To enrich the low fertile soils, farmers were taught and encouraged to prepare compost from household refuse, crop residues and domestic wastewater. With the continuous application of the compost to the soils, the water-holding capacity of the soils has improved. Maize yield has also increased from an average of 200 to 1,600 kg ha⁻¹. All compounds of houses in the community now have two to three compost heaps which are regularly used. Improvements in yield of crops have served as a tangible benefit that has attracted surrounding communities also to adopt PLEC's strategy. In 2003, the number of participating communities increased from the initial 3 to 24 communities.

Questionnaire to Identify and Document Bright Spots

Bright Spots in Africa Questionnaire

Questionnaire on Drivers Effecting Their Development and Sustainability

The Bright Spots Research Project

A Bright Spot is defined as a community or group of individuals that achieves higher food and environmental security, through improvements in (among others) land and water management. Bright Spots are potentially sustainable, and levels of natural resource capital are above ecological and economic thresholds in contrast to unimproved situations. In this project, we are endeavoring to understand the key drivers (i.e., factors) that enable the development of Bright Spots, so as to develop strategies for their spread and replication. We have identified 10 possible drivers that promote or influence the development of Bright Spots.

The objective of this questionnaire is to see whether these proposed drivers are valid and we would be grateful if you would take *15 minutes of your time* in completing the questionnaire. The questionnaire is made up of three sections:

- A. General administrative information
- B. The impact of the project/initiative
- C. An assessment of the key drivers

The questionnaire can be completed in two ways: a) Handwrite your responses in the spaces below and fax back the result to Andrew Noble (+66) 2-561-1230; or b) type in your responses in the space provided and e-mail the questionnaire to the following address: *a.noble@cgiar.org*

We are extremely grateful for your time in completing this questionnaire.

Section A

1. Name of project/initiative:

.....
.....

2. Contact person providing the information:

.....

3. Address/e-mail:

.....
.....
.....

Source: *Analysis of bright spots drivers: Key factors that contribute to their development, 2005. Noble A.D., D.A. Bossio, F.W.T. Penning de Vries, J. Pretty and T.M. Thiyagarajan. In Land degradation: An assessment. Comprehensive Assessment. Research Report. Colombo, Sri Lanka: International Water Management Institute (in review).*

4. Location of project/initiative:

Location–village/community:

Name of town:

Country:

Latitude:

Longitude:

Mean annual rainfall.....mm

5. A short description of the project highlighting the problems addressed that make it a Bright Spot (use as much space as necessary).

6. Outline the solutions or strategies that were implemented to produce the Bright Spot (use as much space as necessary).

7. What were the overall achievements (use as much space as necessary)?

Section B

1. When did the project/initiative start:
 and end?:

2. What was the total investment, including in-kind, (\$) in the project/initiative over the above period from external and/or internal sources, i.e., NGOs, donors, government agencies, community funds, etc.:

| Source | Amount (\$) |
|----------------------------|-------------|
| Bilateral funding | |
| International organization | |
| National government | |
| NGO | |
| Community | |
| Others (specify) | |

Please specify the source of funding:

.....

3. Impacts on food output:

Yields of crops and/or livestock associated before and after the project/initiative. Please feel free to add the names of more crops and livestock if necessary.

Yields and/or animal productivity before or without project/initiative:

Crop 1: name: yield: (t/ha)
 Crop 2: name: yield: (t/ha)
 Crop 3: name: yield: (t/ha)
 Crop 4: name: yield: (t/ha)
 Crop 5: name: yield: (t/ha)
 Crop 6: name: yield: (t/ha)

Animal 1: species: production product: unit:
 Animal 2: species: production product: unit:
 Animal 3: species: production product: unit:

Yields and/or animal productivity after or with project/initiative:

Crop 1: name: yield: (t/ha)
 Crop 2: name: yield: (t/ha)
 Crop 3: name: yield: (t/ha)
 Crop 4: name: yield: (t/ha)
 Crop 5: name: yield: (t/ha)
 Crop 6: name: yield: (t/ha)

Animal 1: species: production product: unit:
 Animal 2: species: production product: unit:
 Animal 3: species: production product: unit:

4. What is the extent/uptake of the project/initiative?:

Impact at the watershed level

- a) Percentage greenery in watershed *before* project/initiative:
- b) Percentage greenery in watershed *after* project/initiative:
- c) Number of trees established:
- d) Percentage of the area impacted by the project/initiative:

Impact in terms of increased water availability

- a) Water availability *before* project/initiative:
- b) Water availability *after* project/initiative:
- c) Irrigated area *before* project/initiative (ha):
- d) Irrigated area *after* project/initiative (ha):
- e) Cropping intensity (how many crops per year):

Impact at the household community level

- a) Number of farmers/households that have adopted the Bright Spot technologies:
- b) Number of hectares under practices using the Bright Spot technologies:
- c) Household income *before* Bright Spot development (\$):
- d) Household income *after* Bright Spot development (\$):

Section C

Which of these key drivers do you feel were important in both the *development* of the Bright Spot and its *continuance* beyond the formal project period? Please address each of the drivers by ticking the appropriate box. 1 = strongly disagree, 5 = strongly agree.

1. *Quick and tangible benefits.* Immediate tangible benefits to the community or individual are an important requirement for the development of a Bright Spot. For example, this may include increased yields within the first year of implementing changes; a reduction in the costs of labor, etc.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

2. *Low risk of failure.* Resource-poor farmers by their very nature are risk-averse and, hence, any changes that are made to create a Bright Spot need to have an element of low risk.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

3. *Market opportunities.* In order for a Bright Spot to develop, markets need to be present and assured to effect change.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

4. *Aspiration for change.* This reflects an internal demand by an individual or community for change that may be driven by faith or a wish to try something different.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

5. *Innovation and appropriate technologies.* Innovations, new technologies and items of information are important key components in the development and continuance of a Bright Spot. This includes new skills and knowledge that contributed to the development of a Bright Spot.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

6. *Leadership.* In order for a Bright Spot to develop and continue there is a need for strong leadership. This may include a single individual or group that champions change.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

7. *Social capital.* Bright Spots develop where there are community organizations, networks and partnerships (private as well as public). This social capital also includes intangible aspects of social organizations such as norms and rules of behavior that can play an important role in promoting sustaining change.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

8. *Participatory approach.* Bright Spots require deliberative processes that actively involve the community in the decision-making process. This includes a strong element of learning and teaching.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

9. *Property rights.* For the development and continuance of a Bright Spot secure (individual or communal) property rights are important to facilitate change.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

10. Supportive policies. Favorable changes in supportive policies at the local, regional and national levels are key drivers for the development and continuance of Bright Spots.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

11. Are there any other drivers, which were important in your project and which should be included in this list? If so, please define them and indicate their level of importance as defined above.

| | 1 | 2 | 3 | 4 | 5 |
|--------------------------------|---|---|---|---|---|
| Development of the Bright Spot | | | | | |
| Development of the Bright Spot | | | | | |
| Continuance of the Bright Spot | | | | | |

Thank you for your time and effort.

Andrew Noble, IWMI 2003.

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