



SCALING-UP FARMING TECHNOLOGIES

Building on MATF projects' achievements

3rd MATF Experience Sharing Workshop

5 - 9 June 2006, Arusha, Tanzania

MATF

MAENDELEO AGRICULTURAL TECHNOLOGY FUND

FARM Africa
Making a lasting difference to Africa's families

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3rd MATF Experience Sharing Workshop

5 -9 June 2006, Arusha, Tanzania

The third experience sharing workshop brought together more than 60 participants who were drawn from Round 3 projects, which ended in late 2005, and stakeholders from various organisations within and outside Tanzania. These proceedings highlight the achievements and lessons from the 16 Round 3 Projects, exploring various emerging issues such as marketing, policy and sustainability of the projects. For more information on MATF and its projects, please visit our website, www.maendeleo-atf.org.





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MAENDELEO AGRICULTURAL TECHNOLOGY FUND

The Maendeleo Agricultural Technology Fund (MATF) is a regional initiative established in 2002 with joint funding from The Rockefeller Foundation and The Gatsby Charitable Foundation (UK), which has been supporting through The Kilimo Trust since 2005.

It is managed by the Food and Agricultural Research Management - (FARM) Africa.

MATF aims to improve the livelihoods of farming communities in East Africa by identifying and facilitating innovative ways of technology transfer, adoption and improved productivity through competitive grants.

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ABBREVIATIONS AND ACRONYMS

ABL	African Beekeepers Limited
AFC	Agricultural Finance Corporation
AIVs	African Indigenous Vegetables
ARI	Agricultural Research Institute
AP Member	MATF Advisory Panel member
AVRDC	Asian Vegetable Research and Development Centre
CBOs	Community Based Organisations
CIDev	Centre For Integrated Development
DANIDA	Danish International Development Agency
ECABREN	Eastern and Central Africa Bean Research Network
FARM-Africa	Food and Agricultural Research Management - Africa
FFS	Farmers' Field Schools
FSA	Financial Services Association
GDP	Gross Domestic Product
ICIPE	International Centre of Insect Physiology and Ecology
ICRAF	International Centre for Research in Agro-forestry
IITA	International Institute of Tropical Agriculture
INED	Integrated Environmental Defence
ISAAA	The International Service for the Acquisition of Agri-biotech Applications
KARI	Kenya Agricultural Research Institute
KEFRI	Kenya Forestry Research Institute
KENDAT	Kenya Network for Draught Animal Technology
KEPHIS	Kenya Plant Health Inspectorate Services
KILICAFE	The Association of Kilimanjaro Speciality Coffee Growers
K-REP	Kenya Rural Enterprise Programme
LUDFA	Luwero District Farmers' Association
M&E	Monitoring and Evaluation
MAFS	Ministry of Agriculture and Food Security (Tanzania)
MATF	Maendeleo Agricultural Technology Fund
MBADIFA	Mbarara Farmers' District Association
MUK	Makerere University Kampala
NAADS	National Agricultural Advisory Services
NAARI	Namulonge Agricultural and Animal Research Institute
NADIFA	Nakasongola District Farmers' Association
NARES	National Agricultural Research and Extension Systems
NARS	National Agricultural Research Systems
NARO	National Agricultural Research Organisation
NEPAD	New Partnership for Africa's Development
NGOs	Non-Governmental Organisations
PMA	Plan for Modernisation of Agriculture
PMC	Project Management Committees
PME	Participatory Monitoring and Evaluation
RMT	Rapid Multiplication Technique
SAARI	Serere Agriculture and Animal Research Institute
SACCOS	Savings and Credit Co-operative Society
SCAPA	Soil Conservation and Agro-forestry Project Arusha
SEC	Sub-county Executive Committee
SIDA	Swedish International Development Agency
SIDO	Small Industries Development Organisation
SIGs	Special Interest Groups
SITE	Strengthening Informal Sector Training and Enterprise
SPG	Seed Producer Groups
SQL	Seed Quality Inspectors
TOSCI	Tanzania Official Seed Certification Institute
ToT	Trainers of Trainers

Opening Session

A brief overview of FARM-Africa
by George Odhiambo
Tanzania Country Director



Achieving a prosperous rural Africa

FARM-Africa in its work, believes in a vision of a prosperous rural Africa. Our mission is to reduce poverty by enabling marginal African herders and farmers to make improvements to their well being through better management of their renewable natural resources.

As an organisation, we have certain characteristics and ways of working that will guide us to achieve this vision. As specialists developing technical expertise in various sectors, we seek to be innovative while looking for solutions to poverty and problems that face herders and farmers in Africa. We also aim to be practical and operational at the grass roots level with farmers.

FARM-Africa is building the capacity of rural people and local institutions in Africa, disseminating practical experience and advocating to improve policy and practice.

Our work

This covers three broad sectors which we consider as our thematic areas. These are as follows:

- **Pastoralist Development**
To improve livelihoods of pastoral peoples and demonstrate viability of pastoralist way of life. This is reflected across different countries.
- **Smallholder Agriculture and Land Reform**
To improve livelihoods of smallholder farmers through intensification of production, improved access to markets and better services.
- **Community Forest Management**
To enhance the livelihoods of forest users and conserve forests through developing and implementing participatory sustainable forest management plans.

In these thematic areas, there are cross-cutting issues that we integrate into our work. These are mainly on gender balanced development and HIV/Aids issues.

Processes of rural change

We have identified a number of processes which form the basis of our expertise in applying technical skills to constraints facing rural communities.

This we believe will spur rural growth and change.

These six processes are:

- Participatory planning, management and research at grass roots level;
- Capacity building of local institutions to ensure sustainability;
- Strategic partnerships and collaboration especially with governments at local, national and regional level;
- Information dissemination to initiate policy dialogue;
- Improving input supply and market access; and,
- Sourcing innovation by testing new approaches and technologies.

Our work currently spans six countries: Kenya, Uganda, Tanzania, Ethiopia, South Africa and Southern Sudan.

“As specialists developing technical expertise in various sectors, we seek to be innovative while looking for solutions to poverty and problems that face herders and farmers in Africa.”



Presentation

By Dr Lydia Kimenyi
MATF Manager



“The results of the work undertaken by the MATF have seen enormous potential capacity at grass roots and institutions to work with many new technologies, especially from research institutions in Kenya and Uganda.”



Reflecting on experiences, lessons and looking ahead

Rather than my usual style of giving the background of the Maendeleo Agricultural Technology Fund (MATF), explaining its establishment and workings, I will deviate in a slightly different fashion. In view of the external evaluation of MATF undertaken in 2005, I would like to share with you and reflect on the achievements and lessons learnt since inception. Then later together with the participants, think about the way forward for the fund.

To begin with, I will restate the purpose and objectives of the MATF. The purpose is to improve livelihoods by facilitating innovative ways for enhancing technology transfer and adoption to improve productivity through competitive grants. It has pursued four main objectives in its work since 2002: to promote dissemination of innovative, proven technologies; to facilitate development of innovative partnerships; to identify and promote innovative ways of working with farmers; and to document and disseminate lessons based on best technologies and dissemination processes.

Since inception, MATF has received over 1500 grant applications. From these, 51 innovative technologies have been funded. These are distributed almost equally in the region. Eighteen of these will be presented in the workshop proceedings. The results of the work undertaken by the MATF have seen enormous potential capacity at the grass roots and in the institutions working with each other to disseminate new technologies from research organisations in the region.

However, the environment in which this work is carried out is quite complex, in terms of the diverse agro-ecology, the socio-economic, farming and cultural systems prevalent in the region. There is great diversity even within one country and this has come with its own challenges for people working among farmers. MATF has observed the challenges our grantees and their partners have had to face. Because of this diversity, it is not easy or possible to come up with a uniform methodology of disseminating technologies, or of facilitating partnerships. In fact even replication of the successes will require some local adaptation, both in methodology and maybe the technologies.

Successes

Numerous successful technologies have been identified and captured from the MATF project portfolio. In some, clear indications of impact can be seen. For example, there is the improved mosaic free cassava varieties which increased productivity from 3MT to 16MT in Uganda. We have also had the projects focusing on value addition of sweet potatoes in Kenya and Uganda, with substantial economic gains generated for households and women groups. Other successful projects have had innovative marketing approaches. For example a project that has enabled small coffee farmers in Tanzania to participate directly in high value export markets, another that has facilitated

Presentation

By Dr Lydia Kimenye
MATF Manager

Reflections on MATF

smallholder farmers to sell their African Indigenous Vegetables (AIVs) in the supermarkets and informal markets. Other promising technologies are on silk, garlic and fish farming in Uganda. Presentations by the various grantees at these proceedings will also demonstrate innovative ways of disseminating these technologies and linking farmers to profitable markets.



Reflecting on Dr Kimenye's Presentation.
From Left: Arusha Regional Commissioner Mr Abasi Kandoro
and FARM-Africa Tanzania Country Director Mr George Odhiambo.

I will now mention briefly the improved and popular crop varieties that have been introduced in the course of our work at MATF. These are cassava varieties resistant to the African mosaic virus, Sweet Potatoes rich in vitamin A, *Narica* rice and improved *Epuripur* sorghum. The latter is being used by Nile Breweries. We have also promoted technologies on improved control of pests and diseases, and natural resource management. Examples here include the control of root rot disease in beans and hot water treatment of yams against nematodes. In Tanzania, there is a project in Kileo on reclaiming salt-affected soils to enable farmers make full use of their land resource.

In other MATF projects, we have technologies which we classify as 'High Value' because they have the potential to generate considerable levels of income for farmers within a very short time. Some of these are: mushrooms (in Hai district of Arusha); silk farming in Uganda and indigenous African vegetables in Tanzania and Kenya.

Furthermore, MATF has projects that deal with value addition. In the Tabora region of Tanzania, indigenous fruits are being processed into wines, juices, jams and marmelades. Bee keeping is quite popular in the region and we have promoted several technologies relating to this.

Some projects are more cross-cutting in that they have used innovative methodologies in disseminating various technologies. For example in these workshop proceedings, a presentation on the use of agro-vets to enable farmers access various technologies (Africa-Now in Kenya).

Partnerships

MATF grantees are working with research organisations, NGOs, Universities, CBOs and micro-finance institutions to create a package that enables farmers to access and exploit available technologies. Through its projects, MATF is striving to understand and capture elements that make partnerships work. Some of the elements that have enable partnerships to thrive and become sustainable are: transparency and budget sharing; a shared or common vision/interest; and aspects to do with institutional versus individual linkages. These issues are explored further in these proceedings through the grantee presentations.

Grantee challenges

Grantees have encountered various challenges in the course of implementing projects. These include: sustaining the commitment from the partners; coordinating regional projects; sharing resources; and meeting the different expectations of the partners involved.

Many of the partnerships developed have been limited in the area of involving private sector. Yet this is crucial in terms of market-led agriculture and especially for successfully linking producers to markets and therefore generating income. In the fight to make poverty history through agriculture, innovative ways are required for engaging the private sector in our work with the aim of empowering the farmers to participate profitably in the

Presentation

By Dr Lydia Kimenyi
MATF Manager

Reflections on MATF

market. These proceedings will demonstrate how some projects are beginning to make inroads on market access and they will assist us in how to develop or promote market access within future projects.

Approaches and methods

Most of our projects have used the mass media to create awareness and sensitise the communities. Others have used drama and songs which have been very effective. The use of ToTs to build the capacity of farmers to participate in the project has ensured continuity through a pool of experts in the community for dissemination and outreach, even when the project comes to an end.

Others have used: farmer-to-farmer cross-learning through exchange visits; posters, leaflets, manuals; demonstration/learning plots; schools and agro-vet stores. The most popular were the group-based approaches. These were formulated as single or multi-functional groups. This is one area that MATF and its partners, while reflecting and thinking about the way forward, needs to look at in terms of cost effectiveness of each of these methods.

Examples of group approaches are: Farmer Field Schools (FFS)- to learn or impart skills, evaluate and select technologies; group-based seed multiplication and distribution; and group-based processing/value addition; and groups as micro-credit/loan administration units. As projects strive to access markets, groups are being facilitated and their capacity enhanced to do marketing for their members. They're sometimes described, depending on the project, as farmer business groups or business support units.

MATF challenges

The biggest challenge so far is about capturing economic impact of the investment projects are making at the farm household level. In virtually all our projects, we can demonstrate that technology uptake has taken place and in most cases productivity in terms of output per area has increased remarkably. The challenge is conversion of the expanded output into income for farmers. To do this, appropriate value addition and marketing strategies are crucial. We also require each project to have good baseline and progress monitoring data. Without appropriate record keeping at farmer level and by project partners, our monitoring and evaluation efforts will not yield much on this variable.

Performance of micro-credit components within projects has not been as good as expected. Presentations from the Round 3 projects in these proceedings will highlight the various challenges encountered. Also, linkage to markets and participation in profitable markets was initially a challenge for these projects but now inroads have been made. Documentation of project experiences is an important objective of MATF and should also be a priority for the projects to inform policy and other agricultural practitioners in the region.

Looking ahead: Where do we want to go?

Our external evaluation conducted late last year, has shown that MATF has achieved most of its objectives. However, as we have seen, the need to put money in farmers' pockets still remains a priority. To do this, we need to build on our success and overcome the challenges. We need to deepen and demonstrate impact, by encouraging scaling-up of selected proven technologies up the value chain. This can be achieved by: building strategic partnerships for better market access and participation; and facilitating development of linkages with the private sector who can provide the needed expertise. It is also important also as we look ahead, to enhance participatory M&E processes at the community level so as to ensure good baseline data.

Keynote Speech

By Mr Abasi Kandoro

Arusha Regional Commissioner

Opening Ceremony

Excerpts from the speech

Ladies and Gentlemen,

I am glad to note that FARM-Africa has been working for a long time in East Africa to reduce poverty by enabling farmers and herders to manage their natural resources more effectively, thereby improving their own living standards and well-being. FARM Africa works with rural communities to develop sustainable and innovative solutions to problems identified by the farmers themselves.

The Tanzania development vision for 2025 identifies priority goals as ensuring food security, improving income levels and increasing export earnings. Agriculture is one of the priority sectors for achieving these goals. Agriculture is the single major contributor to national GDP and is key to the country's overall economic development now and in the near future.

Tanzanian agriculture is dominated by small-scale subsistence farming. About 50% of Tanzanians can be defined as poor with a per capita income of less than a dollar a day. Over 80% of the poor are in rural areas and depend on agriculture as the mainstay of their living. This implies that improvement in farm incomes of the majority of the rural population is a precondition for the reduction of rural poverty in Tanzania. Any strategy for addressing food security, must involve actions to improve agricultural and livestock production and farm incomes.

The most critical weakness in agriculture is low productivity of land, labour and other inputs. This is caused mainly by inadequate finance to obtain productivity-enhancing inputs or capital, limited availability of support services and appropriate technology, forcing the majority to produce only for subsistence.

Initiatives that address these issues by increasing agricultural productivity, profitability and incomes among the rural population therefore go a long way in tackling rural poverty. For this, we view the role and contribution of the Maendeleo Agricultural Technology Fund, as very important.

Ladies and Gentlemen,

I am glad to inform you that MATF has already made four calls for application of proposals which has resulted in 51 projects distributed in Kenya, Uganda and Tanzania. Currently there are 19 projects supported by MATF in Tanzania. These projects include: promotion of mushroom farming by Horti- Tengeru; diffusion of tissue culture bananas; processing of indigenous fruits into jams, wine and juices in Tabora; production and export of speciality coffee by Technoserve among others.

I understand that the farmers who are participating in the coffee project in Kilimanjaro, Mbinga and Mbeya are now selling to high value markets in Europe and USA, where they are getting very high prices (an average net price of US \$1.65/kg parchment coffee).

This workshop brings together grantees from different parts of the East African region who include NGOs, research institutes, academic institutions and private organisations. I hope it will provide a forum for a rich exchange of diverse experiences and lead to improved transfer and application of technologies across East Africa for the benefit of ordinary farmers. With these few remarks, it is now my great pleasure and privilege to declare the 3rd MATF grant holders experiences sharing workshop officially opened.

“Over 80% of the poor are in rural areas and depend on agriculture as the mainstay of their living. This implies that improvement in farm incomes of the majority of the rural population is a precondition for the reduction of rural poverty in Tanzania.”



Presentation

By Chris Webo
MATF Monitoring Officer

“The workshop aims to discuss and explore issues that will emerge from the grantee presentations and establish best ways of addressing them.”



Workshop Objectives

Aims of the 3rd experience sharing workshop

The 3rd MATF Workshop (Monday 5 June through to Friday 9 June 2006) has four specific objectives as follows:

- To share lessons from projects that are now complete. This will be done through plenary presentations and discussion by the grantees.
- To highlight achievements and lessons learnt in the past two years of project implementation. A lot of issues have emerged from each of the completed projects and these will be shared in these proceedings.
- To provide an opportunity for stakeholders to share and learn new innovative technologies, approaches and methods for wide scale dissemination. The workshop is a rich environment to share from each other on these issues.
- To discuss the way forward on emerging issues that affect or hinder the promotion and adoption of innovative technologies in the region. The workshop aims to discuss and explore issues that will emerge from the grantee presentations and establish best ways of addressing them. These will range from: policy; market linkages; micro-credit and revolving funds; sustainability of the projects; and exit strategies.

Discussion and response from participants

Workshop participants briefly discussed various aspects of continuity in the projects after the end of the two-year funding period. AP member Mrs Mbise observed that there was a need for country specific projects to cross over into other East African countries. For example, the challenge of how the indigenous fruits and wine products project in Tabora can get replicated in Uganda and Kenya. Similarly, the cassava project in Nakasongola district of Uganda and the tissue culture banana project in Arusha, Tanzania.

There was also an observation from AP member Mr David Hopkins that grantees should be encouraged not to shy away from sharing about aspects of their projects that had not worked out very well. He commented that as part of the experience sharing exercise, “There were indeed lessons that could be learnt from project aspects that had not worked well, just as well as from those that had been successful. This should be borne in mind as we look at the different projects.”

He further mentioned the aspects of MATF vision and outlook for the Round 5 phase of funding. This phase would draw from the substantial lessons learnt from four Rounds of funded projects since the inception of MATF four years ago. He concluded by saying, “This will result in the selection of a more comprehensive kind of project, one that will go beyond technology transfer and into the question of wealth creation. This will be the new challenge as far as Round 5 is concerned, as well as looking at sustainability of the ongoing projects.”

Report

by Davies D. Onduru and
Evelyn K. Njue
ETC-East Africa

“Specifically, the evaluation was to establish the results and impact of each project on target communities and its contribution to the objectives of MATF.”

Round 3 Evaluation

Highlights from the report

Introduction: evaluation set up

The purpose of the evaluation was to conduct an impact assessment of 18 MATF projects under the third round of funded selections. Specifically, the evaluation was to establish the results and impact of each project on target communities and their contribution to the objectives of MATF. Five of the projects were in Kenya, six in Uganda, five in Tanzania and two regional ones.

Focus of the evaluation

This was on the following key areas:

1. Availability, quality, timing, relevance and responsiveness of inputs and services provided by MATF;
2. Innovation, appropriateness and viability of technology, methodologies and approaches, partnerships and institutional linkages; and,
3. Impact/outcomes of the project/technology, lessons learnt and recommendations specific to the project and MATF.

Evaluation methodology

This was participatory and process oriented approach through:

- Desk reviews and orientation;
- Discussion with MATF staff;
- Interview with grantees and partners; and,
- Interview with beneficiaries and community groups.



Davis Onduru (standing) and Evelyn Njue of ETC East Africa during their presentation.

Project categories

In the evaluation report, the projects have been categorised as follows:

- **Natural resources management technologies;**
 - a) Soil nutrient management project by Kenyatta University in Central Kenya;
 - b) Integrated natural resource management in North Eastern Tanzania by SARI; and,
 - c) Conservation agriculture, a regional project in Kenya and Tanzania by KENDAT.
- **Crop technologies;**
 - a) Climbing beans project by ECABREN in Arusha, Tanzania;
 - b) Clean yam production by CIDev in Kayunga district, Uganda; and,
 - c) Introduction of *Epuripur* Sorghum by Caritas Tororo in Pallisa district, Uganda.
- **Push pull technologies;**
 - a) “Push-pull” for maize stem borer control by KARI-Muguga in central Kenya; and,
 - b) “Push-pull” for stem borer and Striga control by ICIPE-Mbita Point in eastern Tanzania.
- **Product processing technologies;**
 - a) Gari processing by the Mid North Private sector promotion company in Lira, Uganda;
 - b) Solar drying of bananas by MBADIFA in Mbarara district, Uganda; and,
 - c) Fruit processing by ARI-Tumbi in Sikonge and Kibondo districts, Tanzania.
- **Income oriented technologies;**
 - a) Small scale commercial apiculture by SITE in Taita/Taveta districts, Kenya;
 - b) Micro-leasing of Langstroth beehive by K-Rep in Bomet district, Kenya;
 - c) Speciality coffee by Technoserve in Mbinga and Mbozi districts, Tanzania; and,
 - d) Marketing of AIVs by AVRDC in Tanzania and Kenya.
- **Unique methodologies;**
 - a) Promotion of Rural Technologies (PORT) by Africa Now in Western Kenya;
 - b) Promotion of orange fleshed sweet potato by Makerere University in Kampala,

Projects Evaluation

Report

by Davies D. Onduru and
Evelyn K. Njue
ETC-East Africa

Evaluation of MATF Round 3

Uganda: and,
c) Vanilla promotion by LUDFA in Luwero district, Uganda.

Cross-cutting lessons

The following were some of the lessons that were observed from the evaluation:

a) On innovative aspects:

(i) Technology

- Farmers are attracted to technologies with multiple benefits.
- Selection of technologies for promotion should take into consideration issues of availability and affordability.
- Farmers easily adopt technologies that show demonstrable benefits in a short period.

(ii) Partnerships

- Partnerships work well where responsibilities are clearly demarcated and where there is synergy in skills (production to marketing and utilisation of technology products).
- Transparency about financial resources available for the project is important in mitigating potential misunderstandings among project partners.
- Frequent sharing of experiences with partners creates an opportunity to correct mistakes for harmonious implementation.
- Forming partnerships and linkages with other development organisations promotes leverage and enables the project to do more with limited resources.

(iii) Approaches and methods

- It was seen that the group approach was effective in technology transfer. The group members learn from each other and members support one another.
- Community participatory approach gives farmers a sense of ownership and raises their confidence.
- Approaches that emphasise farmers' roles, involving them in participatory monitoring and evaluation leads to project ownership and commitment.
- Joint planning and development of operational tools is necessary for a smooth implementation of activities.

b) Cost-effectiveness of projects

(i) Towards increased productivity and impact

- Technologies that increase productivity and household income, within the project period, are those that have a complete production-market cycle (production for consumption and for marketing).

(ii) Number of farmers reached

- Technologies that generate products with high market value and those that address farmers multiple needs (food security, cash) are easily adopted.
- Using existing local institutional structures makes it easier to reach more farmers.
- Adoption is influenced by ease of accessibility to the technology being promoted.

c) Linking farmers to markets

- A marketing partner is essential in driving group marketing activities.
- Maintaining export markets needs the building of trust and business acumen: this means consistency in quality, quantity and timing of a shipment.
- Factoring (providing credit for advance payments, transport, market levies etc) and market guarantee can enable small-scale farmers penetrate formal markets, which have been a preserve of medium and large scale producers.
- Linking farmers to markets requires a good understanding of a farmer's production strategies, constraints and opportunities.

Discussion and response from participants

Workshop participants discussed various issues arising from the evaluation. From the climbing beans project implemented by ECABREN, there was a clarification on the issues that were not captured in the evaluation. On methods and approaches used, there was a stakeholders meeting and an exchange visit for farmers to neighbouring countries. The CIDev representatives also gave a clarification on the treatment tanks (Clean Yams project). Participants were informed that farmers have not been using

Projects Evaluation

Responses

Panel Discussions

Evaluation of MATF Round 3

the sauce pans for heat treatment of the yams, although suggestions have been made for their use. They have been discouraged because of the inability of being able to gauge the temperature while in use. It was however acknowledged that the tank sizes needed to conform to the farmer's requirements.

Caritas Tororo, promoting the *Epuripur* sorghum, issued a clarification on the linkages developed in the course of the project. Market linkages were done well and the farmers were involved in their formulation.

There was also a comment by AP member Joseph Oryokott on the low honey volumes recorded from the K-REP beekeeping project (297 Kg) as compared to the SITE project (1035 Kg). He proposed that this should be looked at again to establish the reasons behind the figures. He also suggested that poor construction and location of beehives could invariably lead to poor colonisation, hence low yields.

The issue of market information also featured in the responses. Oryokott looked at how this information could be generated and disseminated to farmers. He suggested that the information should be made part and parcel of the project at the start-up stage for future MATF projects.

A general recommendation was also made on the issue of loan repayments. That farmers taking loans or leasing equipment should be encouraged to take up other income generating projects even as they participated in the funded project. This was to have an alternative income base in case the main project was not generating the expected income and would address the issue of loan defaulting.

On the Lushoto project (SARI), the evaluators were asked to clarify on the information provided on para-professionals who were working and have been recognised by the government. There was a need to establish whether they were working at a fee and whether there was potential for linkages with other areas.

AP member Mrs Mbise observed that farmers in the Vanilla project had filled their farms with the crop. She was concerned that if the crop did not do well, there would be no immediate option for the farmers. Market information showing trends in the international markets should be provided to farmers. The issue of tangible government support to strengthen farmer associations was also discussed.

A proposal was put forth by a participant for the projects to clearly articulate the different exit strategies developed and unique PME strategies in place. This could be in the area of participatory scaling-up in ToT training of those selected by communities.

AP member David Hopkins suggested that certain issues should be addressed keenly during evaluation of the projects, particularly whether projects had gone according to plan; how they were initially conceived; and reasons for their success. A clear recommendation on the way forward should also come out of the exercise.

On the revolving fund issue, FARM-Africa Tanzania Country Director George Odhiambo, commented that it was important to draw lessons from where it had worked, as well as where it had not worked well. He observed that success depended on group cohesion and recovery mechanisms. While the Kenyan component of the KENDAT project had more outgoing groups, the Tanzanian side was faced with mobilisation problems. The issue of continuity was still not very clear though, when exit strategies were examined in detail.

Presentation

By Augustine Cheruiyot

K-REP Development Agency, Kenya

Beekeeping Projects

Transfer of the Langstroth beehive technology to subsistence farmers through micro-leasing

The purpose of this project is to alleviate rural poverty by introducing subsistence farmers to commercial beekeeping. This will be achieved through enabling them to acquire the Langstroth beehive through micro-leasing.

K-Rep Development agency (KDA) under this project seeks to introduce modern bee-keeping techniques to subsistence farmers to enhance the quantity and quality of the honey they produce.

“Through this process, 717 farmers have been brought on board. The total of leases financed amounts to Ksh 3,966,900 for 934 hives.”



An apiary in Bomet district, Kenya.

Broad objectives

- Alleviate poverty in rural areas by enabling subsistence farmers to acquire an income generating asset - a beehive through financial leasing;
- Improve socio-economic condition of poor people in rural areas by providing them with alternative income generating opportunities; and,
- Develop a sustainable leasing scheme for accessing income generating assets to poor people in marginal areas.

Specific objectives

- To train 800 subsistence farmers in Bomet and Buret districts in commercial beekeeping using Langstroth beehive technology. The two districts are endowed with a rich diversity of flora coupled with good climate ideal for beekeeping. Subsistence and smallholder agricultural and livestock activities are the main economic activities;
- Establish a micro-leasing mechanism for acquisition of 800 Langstroth beehives, which will form seed money for a revolving fund for the micro leasing scheme for subsistence farmers in Bomet and Buret districts;
- Enable 800 subsistence farmers to acquire Langstroth beehives worth Ksh 3.6 million through the hive micro-leasing scheme; and,
- Promote the use of Langstroth beehive technology among subsistence farmers.

Micro-leasing: the terms and conditions

The following were the terms and conditions of the K-REP micro-leasing of the Langstroth beehives:

- Interest rate: Groups at 16%, Intermediaries at 12% flat rate p.a.;
- Duration - a maximum of 2 years;
- Grace period - 2 months;
- Repayment structure: Ksh 50 monthly and half of honey harvested. (One hive produces an average of ten kilos sold at Ksh 100 per kilo);
- Collateral – The hive itself and group, or intermediary guarantee; and,
- Lease amount at a minimum of Ksh 4, 700.

Partners

The current key partner in this project is Honey Care Africa.

Their role include:

- Technical support to farmers in liaison with Ministry of Livestock, Fisheries and Marketing;
- Supply of Langstroth beehives;
- Establishment of demo centres;
- Purchase of honey from the partners;
- Establishment of honey collection points in liaison with respective intermediaries;

However, the farmers have a right to sell their honey to any buyer as long as

Presentation

By Augustine Cheruiyot
K-REP Development Agency, Kenya

Beekeeping Projects

they pay the loan.

The Micro-leasing Process

The following activities are conducted during the micro-leasing of the beehives:

- Sensitising;
- Demonstration of Langstroth beehives;
- Purchase and distribution of beehives and equipment;
- Collection of harvested *supers* and extraction; and,
- Lease payments.

Through this process, 717 farmers have been brought on board. The total of leases financed amounts to Ksh 3,966,900 for 934 hives. In terms of repayment, high levels have been recorded with the amount outstanding to date at Ksh 3,224,966.

The following FSAs in Bomet and Buret took part in the micro-leasing of the Langstroth beehives to their members: Makimeny; Mulot; Gelelele; Siongiroi; Bingwa and Uswet.

The type of equipment financed ranged from the beehives, bee suits, hand gloves, smokers and the hive tools.

Lessons learnt on beehive leasing

These are some of the lessons arising from the project:

- The bottom poor are reached;
- Demand is there so long as there is a market;
- Project impact on poverty alleviation. It was seen that the minimum number of hives deriving the most economic benefit for the farmer was ten. With only ten hives, a poor farmer will earn a minimum of Ksh 20,000 per year, which translates to an average of Ksh 1,667 per month, which is above the poverty line of Ksh 1,239 per month;
- Micro-Leasing is a good channel for technology transfer;
- Sustainability: the farmers are able to continue with the project;
- The project had lower cost of implementation;
- Scaling-up of the model is possible; and,
- Importance of partners and clearly defined roles.

Challenges

The following challenges have been encountered during project implementation:

- Appropriate apiary management was not readily implemented;
- Invasion of pests in the beehives;
- Training;
- Failure of most farmers to make the required Ksh.50 payment per month for every hive leased out preferring to pay everything from sale of honey
- The need for demo cum harvesting centres within implementing FSAs; and
- Delayed colonisation of hives lead to delayed harvesting hence delayed repayments of loans.

Discussion and response from participants

There was a query from a participant who requested clarification on the issue of a break-even point based on the Ksh 4700 on the Langstroth micro-leasing component of the beekeeping project. The response from K-REP was that the break even point had not been formally set and that the initial objective was to meet the needs of the farmers. However, information availed from Honey Care Africa showed that with 10 hives fully colonised (after six months), a farmer could harvest up to 40 kg every two months thereafter. This could be obtained with good apiary management, leading to a minimum yield per year of Ksh 20,000. Return on investment would therefore be expected after the second year, working with minimal harvests.

Panel Discussions

Beekeeping Projects

Other participants were keen to find out whether the demand for the hives was measurable. The response was that the project had recorded an average of one to two hives per farmer.

Concern was also expressed about the low production of the hives in the project. How effective was the monitoring system? The explanation was that the FSAs monitored the collection of payments from farmers which was pegged on production. The low production levels recorded in some instances reflected also the re-payment levels. The monitoring system was therefore effective.

There was a clarification from a participant on the actual measure of the poverty line. The workshop was informed that the poverty line stands at an income of Ksh 2,190 per month rather than the Ksh 1,239 that was earlier provided. The participant observed that the Ksh 1,667 monthly income from beekeeping was therefore still below the poverty line.

Participants requested information on who sets the prices for the honey products. The response from K-REP was that the beehive manufacturers were the ones who ultimately set the price. The marketing role was however very crucial for inspiring the confidence, credibility and trust of the product.

A participant was keen to know how the FSA approach could be replicated elsewhere as a group approach. K-REP's response was that there were plans to implement a similar project in Makueni and Kitui districts. Conditions were however, very different from the current project areas and therefore studies on the viability of this was underway.

On sustainability, participants requested information on the measures put in place by K-REP to ensure continuity of the project at the end of the funding period. The response from K-REP was that there was a strategy to get banks involved in lending to the FSAs, through the creation of a revolving fund.



Presentation

By Ruth Mbithi

SITE Enterprise Promotion, Kenya

Beekeeping Projects

Technology transfer for small-scale commercial apiculture

The project was a two-year initiative funded by MATF. Implementation began in December 2003 targeting beekeepers who were members of the Taita Taveta District Association. Taita Taveta is a region with a long history of traditional beekeeping and with a high honey production potential. Three years ago, this potential was realised when beekeeping became commercialised.

Beekeeping in the district is characterised by individual farmers owning a small number of hives, from five to 50, but in some cases up to 200. The hive varieties are loghives, Kenya Top Bar and Langstroth hives.

The project goal was to increase the incomes of small-scale honey producers by improving the productivity and market acceptance of their honey and other hive products.

The purpose was to transfer technologies for production, harvesting, post-harvesting handling and processing of hive products and to increase the capacity of the community to continuously market their produce.

Project objectives

The project set out to achieve the following:

- To transfer technology/skills and develop a competitive production and marketing structures for hive products in Taita Taveta district. This was to commercialise beekeeping and generate wealth for the community;
- Establish a honey processing plant;
- Local production of appropriate tools and implements for hive management, honey harvesting and handling;
- Building skills on bee husbandry and colony management;
- Developing systems and capacity for refinery management and honey collection; and,
- Building the capacity of Taita Taveta Beekeeping Association (TTBKA) as a producer and service provider.

The project partners

The following were the key partners implementing the project and their roles:

- SITE - Grant Holder and overall project direction;
- TTBKA - Mobilisation of beekeepers, coordinating beekeepers, honey collection, refining and marketing, provision of services;
- KEFRI - Establishing multi-purpose nurseries and technical advice; and,
- Market linkages and purchase of honey by Honey Exchange (HONEX).

Capacity building modules

Activities were carried out to build capacity in the project as follows:

- Bee husbandry skills;
- Carpenters' hive production training;
- Training of tailors and tinsmiths (harvesting gear and accessories); and,
- Capacity building on good governance and management of the association.

Project achievements

The main achievement of the project was to commercialise beekeeping and generate wealth for the community. Indicators of these achievements include:

a) Community-managed honey refinery;

- An operational community owned low cost honey refinery with a high quality

“The project goal was to increase the incomes of small-scale honey producers by improving the productivity and market acceptance of their honey and other hive products.”



Presentation

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Beekeeping Projects



A bee husbandry training workshop



A workshop in Taita Taveta
Artisans have been trained on how to assemble hives

processing, equipment and capacity to handle over 150,000 kg of honey per annum.

- There is well-trained staff who operate and maintain the refinery equipment, honey quality control and hygiene standards, keep honey record and basic bookkeeping.
- b) Developed local capacity for production of inputs and equipment needed for commercial beekeeping;**
- 19 trained artisans are profitably producing hives.
 - There is a 50% increase in production.
 - An increase in access to hives and hive inputs.
- c) Enhanced capacity of TTBKA to profitably undertake honey refining and marketing;**
- A well-governed organisation of the beekeepers (TTBKA).
 - A co-ordination office at the refinery premises with organised records and operating systems.
 - A 21 member trained leadership is in place.
 - Management and governance systems in place.
 - Five active cluster zones each with fully equipped honey collection centres and honey harvesting equipment. Beekeepers access these accessories at a small fee. This has led to enhanced capacity to bulk honey, receive payments for its members and access harvesting kits and buckets as well as maintaining members honey records.
 - Member participation in decision-making has also been enhanced as a result of established cluster structures and membership.
 - Financial systems are in place for procurement, marketing of honey and supply of inputs.
 - Over 300 beekeepers are producing high volumes of quality honey as a result of training on bee husbandry.
- d) Developed capacity for refinery management and facilitation of access to inputs;**
- A well-managed financial system in place. All honey and inputs income and expenditure transactions are managed by a well-trained refinery committee.
 - A well-trained refinery committee and staff in place.
 - Establishment of a loaning scheme for beekeepers to access inputs (hives, supers, harvesting containers).
- e) Increased tree cover as a support to the beekeeping enterprise as well as diversify sources of income among local households;**
- Five multi-purpose tree nurseries have been established in each of the clusters through partnership with KEFRI both for bee forage and commercial purposes.
 - Increased tree planting by individual beekeepers and the whole community
 - Replication of tree nursery established by community groups for tree cover.
 - 40 per cent increase in incomes from sale of tree seedlings by individual farmers.
- f) Establishment of long-term links between producers and buyers;**
- A sustainable marketing linkage with HONEX which guarantees a market for all quality honey produced by its members. The association currently has a marketing agreement for three years.

Lessons learnt

a) On methods and approaches

- Technology transfer for low-income communities is a long-term intervention

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requiring a mix of technical, social/human and business inputs, as opposed to a short-term technical approach. A balanced mix of these inputs seems to be critical to take up and sustain the technology transfer intervention.

- It is important to learn the culture and tradition of the community before introducing a new technology.

b) Partnerships and linkages

- There are opportunities which communities can exploit if well organised.
- Self organisation and governance are very important for successful technology transfer.

Key challenges

The project did not encounter serious problems that would have compromised its objectives and aims. However, it met a number of challenges as follows:

- The district has a history of free or highly subsidised beekeeping inputs from past NGOs working there. Though the project approach was clearly articulated during the project initiation, the beekeepers at times expressed interest in free inputs; and,
- Conflict of interest by government extension staff.

What worked well

- Involving the beekeepers in all the stages of project implementation.
- Commercial uptake of technology by local artisans (new business opportunity, close proximity to local beekeepers, well defined product, skills training and costing).

Vision for sustainability

- Community approach for competitiveness and creating demand is very critical.
- The approach is based on ownership by a large number of beneficiaries thereby making it sustainable. In addition, there has been facilitation in self organisation, governance and business orientation.

Discussion and response from participants

Participants requested more information on the impact of the project at household level. The response from SITE was that, from the various case studies undertaken, there was data to support a positive impact. It was observed that families whose children were not previously going to school had begun to do so. Other beekeepers had managed to invest in more hives.

There was a request made to the presenter to provide data on the total number of refineries provided to the beekeepers. The figures were not immediately available. Other participants were keen to find out whether the hives produced by the local artisans at Ksh 3000 were acceptable to the community. The response from SITE was that the hives were being bought and that they had maintained quality standards despite the reduced cost (Langstroth hives from MATF beekeeping projects normally retail at Ksh 4500).

A participant requested more clarification on the issue of conflict of interest by the government extension officers. The response was that SITE had held a discussion with the officers and their superiors to address the problem.

Presentation

By Elizabeth Obanda
Africa Now, Kenya

“What was needed was simple, affordable and improved technologies with which to maximise output of produce with market value.”



Bucket drip irrigation project

Promotion Of Rural Technology

Working with rural private sector to scale-up technology transfer to small-scale farmers

The aim of the project was to scale-up technology transfer by working with the rural private sector to promote a range of improved and viable agricultural technologies to the farming communities of Western and Nyanza provinces of Kenya. Kakamega, Vihiga, Siaya and Kisumu districts were targeted in the two provinces. The project name was given the acronym PORT (Promotion Of Rural Technology).

Background: characteristics of Western Kenya

The project area is characterised by high population density, small land holdings, widespread land degradation, poor yields, small-scale agriculture as an economic activity, poverty and hopelessness.

What was needed was simple, affordable and improved technologies with which to maximise output of produce with high market value.

Aspects of these included:

- Sustainable technology transfer method;
- Strong linkages between technology providers and stores;
- Creation of information centres;
- Demo and bulking sites; and,
- Well-trained community resource persons.

Project objectives

The PORT project set out to achieve the following:

- Develop agro-input suppliers directory.
- Network 20 rural agro-vet stores and 10 suppliers.
- Network 50 seed-bulking farmers to KEPHIS and local research stations.

Technologies transferred

The following technologies were promoted by the project:

- Langstroth hives;
- Kerosene brooders/incubators;
- Food security crops;
- High value perennial crops;
- Indigenous vegetables;
- Bucket drip irrigation;
- Kakamega Striga Tolerant Population (KSTP) maize and root-rot beans; and,
- Agro-forestry.

Approaches and methodology

The following approaches were used in project implementation:

- Use of existing private rural agro-vet stores;
- Watershed Management Committees (WSMC);
- Diverse partnerships;
- Community-based resource persons;
- Pass-back system of seed distribution;
- Credit facility linked to Village banks;
- Alignment with government policy;
- Community contribution; and,
- Field officer in the locations.

Partners and their roles

- World Agro Forestry Centre (ICRAF) - Training and provision of fodder seeds.
- KEFRI - Training and provision of tree seeds.

Presentation

By Elizabeth Obanda
Africa Now, Kenya

Promotion of Rural Technology



Left: maize farmers admire their healthy crop in Vihiga district.
Above: a pineapple plant in Siaya.

- ICRAF, Ministry of Agriculture and Livestock Production - Training and backstopping.
- KARI Kakamega and Kibos - Training and provision of drip kit, KSTP maize, improved cassava and orange fleshed sweet potato.
- Ugunja Community Resource Centre - Backstopping and provision of orange fleshed sweet potato vines.
- Special Foods International - Training, backstopping and provision of kerosene brooders and incubators.
- Newcastle store - participating agro-vet store.
- Jawa store - participating agro-vet store.
- Contact farmers - Demonstration of technologies within the community.

Dissemination methods

The project used the following methods to disseminate the various technologies to the target communities:

- Farmer field days;
- Exhibitions and regional shows;
- Brochures, booklets, posters and signboards;
- PORT launch video, PORT project DVD, CITIZEN Television and Kenya Broadcasting Corporation's *Mali Shambani* Radio listeners;
- Publication of a farmer-stockist directory;
- Display boards;
- Case study booklets and Africa Now annual review newsletters;
- Africa Now project launches;
- Natural Resource Management evaluation video and DVD.

Achievements:

The following were the achievements recorded from the project:

- 1,890 people were reached through 14 field days;
- 18,550 people made inquiries at the stores;
- 17,621 people made inquiries at the demo farms;
- 50 farmers trained directly on technologies;
- 120 trained on micro-finance;
- 20 agro-vet stores were trained and linked to 28 technology providers;
- 9 farmers completed a business skills course;
- 200 technology booklets published;
- 250 case study magazines published;
- Citizen TV coverage of OFSP and beekeeping technologies;
- Publication of 500 Kiswahili and 5200 English brochures detailing various technologies.
- 500 A1 size poster capturing essence of PORT were printed;
- A credit facility for farmers was developed and piloted;
- A total of Ksh 307,000 was loaned to 50 farmers;
- 27 farmers were trained in community seed production and four actually produced KSTP seed maize which was sold to the community;
- Fabricated and erected display and signboards for all the 20 stores;
- Established 50 demo/bulking farms;
- Inputs for participating stores and farms were purchased;
- Published 1000 directories with names of demo farms, stores and

Presentation

By Elizabeth Obanda

Africa Now, Kenya

Promotion of Rural Technology



A farmer prepares orange fleshed sweet potatoes for solar drying in Kajulu, Kisumu district.

technology providers; and,

- Information was disseminated through the Kenya Broadcasting Corporation radio *Mali shambani* listeners. This ran every Monday for one month.

Farmers adopting various technologies

A number of farmers adopted the promoted technologies as follows:

- Orange flesh sweet potatoes - 5250 people in 10 locations;
- Mosaic tolerant cassava - 200 farmers;
- Pineapples - No suckers passed on so far;
- Beekeeping - Adopted by 30 farmers. 10 demo and 20 hives bought;
- Local poultry - 10 demo farmers with brooders;
- Drip irrigation (20 litres and 1200 litres) - 42 demo farmers;
- Local vegetables - 5250 people;
- KSTP Maize - 1020 farmers (20 demo, 1000 purchased a kilo each); and,
- Tissue culture bananas - 20 demo farmers.

Outcomes

The achievements of the PORT project resulted in the following:

- Increased access to improved seeds;
- Increased access to equipment;
- Increased access to information;
- More farmers and stockists with technical skills;
- Increased access to finance;
- Increased innovation, creativity and enterprise among the farmers;
- Savings culture introduced at the village banks; and,
- Government recognition (The water shed management committee sits in the sub-district development committee).

The **impact** of these technologies on the target communities was increased food security, increased household income and improved health.

Emerging issues from the project

1. Government policy:

The following policy areas influenced the project implementation:

- Focal area approach;
- Agro-vet stores;
- Demand driven policy;
- Promotion of short-term crops by Ministry of Agriculture; and,
- VAT and Pin numbers for products targeting supermarket outlets.

2. Micro-credit:

Water shed management committee, village banks, local administration were all key in ensuring credit access for the farmers. Credit repayment stood at 89 per cent at the pilot stage. The scaled-up phase is still going on.

3. Marketing:

- Business training was conducted for farmers to enable them take advantage of an existing orange flesh sweet potato flour market;
- Farmers were also trained in value addition;
- Project implementers provided credit for equipment;

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By Elizabeth Obanda
Africa Now, Kenya

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- Farmers formed an umbrella marketing group which introduced representatives to supermarkets in Kisumu;
- Project implementers spoke to Trades officer on Value Added Tax; and,
- Advise was given to farmers on PIN numbers.

Sustainability

Various measures were put in place to ensure project sustainability. These were,

1. Lasting linkages created by the project:

- Agro-vet to agro-vet;
- Farmer to agro-vet stores;
- Agro-vet to technology provider;
- Technology provider to farmer;
- Agro-vet to finance institutions such as AFC;
- Farmer to village banks to farmers and to supermarkets;
- Farmer to government extension officers; and,
- Contacts between farmer to farmer.

2. Community governing structures or local administration:

- These are now involved in backstopping, distribution of resources, loan recovery and compliance;
- Pass-back system (Contact Farmers recruit, train and provide seed to other farmers);
- Training and capacity building conducted; and,
- Enterprise and trade development introduced to target farmers. This was done through the sale of vines, KSTP maize seed, orange flesh sweet potato cooked products, trainers for other organisations, fabrication and sale of hives.

Key lessons

These are the lessons learnt during the project implementation:

- Project requires a flexible budget (in case of contingencies);
- Fewer technologies should be promoted;
- One should have strategic partnerships with clear roles;
- Monitoring and evaluation should be established at the project onset and effective beneficiaries' participation encouraged.

Challenges

The following challenges were encountered:

- Cost, appropriateness and availability of the technologies was challenging;
- Weather - This was sometimes unreliable and extreme;
- Vast area of coverage;
- Providing regular feedback to funders, financial report format and policy on implementing staff salary; and,
- High expectations and commitment of partners.

Discussion and response from participants

Workshop participants gave a number of responses and comments to the presentation. There was a question on the rationale behind the promotion of the KSTP maize in particular. The response from Africa Now was that the maize, apart from its availability, was also resistant to the striga weed and stem borer infestation. It did very well in the project's target districts. An example of a lady farmer who had managed to harvest 9 bags in one season was cited to support this.

Another enquiry was made concerning the issue of information quality passing through the agro-vet stores to the farmers. How did Africa Now address this issue? The response was that they had ensured each store received dissemination booklets and brochures. There was also continuous training of store managers on the technologies.

Participants were keen to find out how the generalised approach used by Africa Now compared with the specialised approach used by other grantees. The response

from the presenter was that structures had been put in place to follow up on the numerous technologies. As opposed to the specialised single technology approach, many donors were involved in the Africa Now PORT project. Among them was the Department For International Development (DFID), whose funding to the project ended in January 2006. Other sponsors were Trusts and Foundations in Europe. While implementing the project, Africa Now started to encourage CBOs to apply for CDF (Constituency Development Fund) money, for sustainability of adopted technologies. These would also cater for the period when MATF funding ends.

Since Africa Now had promoted many technologies at the same time, a query to establish the best and worst aspects of the PORT initiative was put to the presenter. She responded by indicating that the best performing projects were the orange flesh sweet potato and the African indigenous vegetables. "These were implemented very well with the help of watershed committees," she added. The worst performers were projects which had many partners.

There was concern on whether the data provided on the project impact could be verified, especially for purposes of in-depth study. The response was that monitoring and evaluation forms had been developed after an MATF evaluation on the project. The result was that data could be captured more accurately hence the presented information was verifiable from the recorded forms.

Participants noted that the project beneficiaries (farmers) may not be good at marketing the projects to others. What was Africa Now doing to assist? The presenter said that Africa Now usually assisted through dissemination materials, media engagement and exhibitions. They extended this assistance to their partners such as research institutions which may not know how to market technologies emanating from their research.

Finally, there was a query on the target farmers of the PORT initiative in terms of gender and age. The response was that anyone under 60 years was encouraged to take up the technologies. Young people had done remarkably well in adopting the promoted technologies. An example was cited of a young man in Siaya district who had adopted the Langstroth beekeeping technology and was marketing it enthusiastically to neighbours. On the gender question, the presenter noted that most men in targeted areas had been trained but unfortunately were not implementing the technologies.



Presentation

By Ferdinand Olang'

Mid-North Private Sector Development
Company - Lira district, Uganda

“Gari is a light, white or creamy crystalline food made from pure and naturally dehydrated cassava. The innovative food product can be prepared within minutes and served with most dishes.”

Crop Production Technologies

Promoting gari processing technology in northern, eastern and central Uganda

Project background

Cassava is a major household crop grown by majority of the households for food with some being sold fresh at low prices in the local markets. Excess production is normally stored in farms with a high risk of going bad, hence creating food insecurity. Increased productivity of the crop had resulted from good research that had been done on improved crop management methods which had been introduced to the farmers.

The project had to initially overcome perceptions that cassava was a backyard crop of low value. These perceptions had contributed to its under utilisation and hence low income for the farmers.

Through this project, the Mid-North Private Sector Development Company based in Lira district of Uganda, has been addressing the issue of excess production of cassava and its under-utilisation by most small-scale cassava farmers. The company has been promoting the gari processing technology to generate farm incomes from cassava and provide solutions to food insecurity in selected districts of northern, eastern and central Uganda.

Gari is a light, white or creamy crystalline food made from pure and naturally dehydrated cassava. The innovative food product can be prepared within minutes and served with most dishes. It can also be made into porridge. With a shelf life of two years and containing no additives, the product is ideal for schools, hospitals, prisons, military and internally displaced peoples' camps (IDPs).

gari, while being gender friendly in its preparation, retails at three to four times the price of the fresh cassava. The gari processing technology has high potential for mass production and export, opening up commercial opportunities for the cassava farmers.

Project objectives

The project set out to achieve the following:

- To process the excess cassava into gari;
- Utilise cassava at household levels to address food security;
- Commercialise gari for higher household incomes; and,
- To disseminate the technology to 270 households in Uganda.

Specific project goals

- Procure two units of processing equipment;
- Train 270 farmers in gari processing and utilisation;
- Promote and develop nine farmer groups into commercial producer units; and,
- Streamline the gari marketing channels.

Approaches

These were the approaches that were used during project implementation:

- Training of farmer groups in processing and utilisation;
- Creating relevant partnerships;
- Developing farmer groups;
- Promote the growing of improved cassava varieties;
- Establish market linkages.

Key partners

The following were the key partners in the project and their roles:

- Mid-North Private Sector Development Company - project leadership.

Presentation

By Ferdinand Olang'

Mid-North Private Sector Development
Company - Lira district, Uganda

gari Processing Technology



A Trainer demonstrates how gari is pre-cooked over a fire.
On the right are packets of the product displayed on a shop shelf.



- NARO and NAARI - farm management.
- Palmpot Limited - provided technical training.
- Mid-North sister companies - Co-ordination of group activities.
- District Farmers Associations - mobilisation and extension services.
- International Institute of Tropical Agriculture (IITA) - farm trials and quality controls.
- Farmer groups - participation and local materials.

Project outcomes

The project realised the following results:

- 366 cassava farmers were able to process, sell and utilise gari at household levels;
- Nine cassava demos and two on-farm trials established;
- Nine commercial farmer groups were formed and developed;
- A draft gari training manual has been tested and is now ready for publication;
- A gari marketing plan for 2005/7 was produced and implementation has started;
- A micro-credit policy was developed with seed capital of Ushs 21M, which was used to purchase six sets of processing equipment;
- A new product code-named "Breakfast Snack" is currently being developed by food scientists from NARO. This will use gari as a raw material.

Marketing plan implementation:

These were the stages of implementing the marketing plan:

- Groups were trained in agri-business principles;
- Four best varieties of the product were established;
- Nutritional facts on gari were established as follows;
 - a) Carbohydrates, calcium, energy (370 calories/100 kilos), moisture content (6-8).
Results are now being used to meet labelling requirements for marketing;
 - b) gari now meets international quality and safety standards.
- Market linkages were started and aspects of these can be seen below;
 - a) Lira shopping outlet was opened in April 2006. It handles 1,500 kgs a week from farmers.
 - b) Promotions were conducted in 11 schools in Lira district before they closed for holidays, selling 584 Kgs.
 - c) The Kampala outlet was established to handle excess gari from the rural towns.

Emerging issues from the project

- Excessive market demand - especially from the youth in schools. This is now the biggest target market;
- Effective co-ordination of the complementary functions of production, processing and marketing required;
- Policy support required to enable access to bigger markets (schools, army, IDPs);
- Cassava diseases such as *mosaic* and *Brown streak* remain a big challenge;
- Stronger entrepreneurial touch required of the farmers to be market-oriented;
- Market linkages through a private enterprise is needed;
- Micro-credit management to be guided by the micro-credit policy document; and,
- Sustainability of the project – through strong market approach and partnerships with facilitators so as to remain relevant in the competitive market place.

Presentation

By Ferdinand Olang'

Mid-North Private Sector Development
Company - Lira district, Uganda

gari Processing Technology

Discussion and response from participants

The responses on the presentation started with a comment from Dr Lynam of Kilimo Trust, on the way forward in scaling out the project. He suggested that the project should evaluate costs and profitability at every stage in the value chain - from the farmer to the retailers "just to assure the project co-ordinators of financial sustainability of all the systems as they scale-up."

He also touched on the related issue of lump-sum investment in the gari processing equipment. He presented the options of "whether one should go to scale through private entrepreneurs investing in the processing or go to scale through farmer associations organised around the processing equipment." He added that this issue could as well apply to the beekeeping projects presented earlier in terms of purchasing the centrifuge machine. From the SITE presentation, Honey Care Limited presented a private sector approach while the Taita Taveta farmers presented a farmer association approach.

AP member David Hopkins added to the discussion by raising the issue of input costs and output benefits within MATF projects in general. He emphasised the need for project implementers to verify whether there was a sensible return on investments after looking at the two aspects. The outcome should be brought out more clearly in future experience sharing presentations of MATF projects.

A recommendation was made by AP member Joseph Oryokott on the importance of projects establishing critical linkages with national programmes such as NAADS, early in the project life. In the case of the gari processing technology which was promoting cassava as an enterprise by farmers, such linkages would provide opportunities in advisory services, especially as the implementers embark on exit strategies.

He wrapped up the discussion by offering observations on the way forward for the gari project. He noted that the latest NAADS programme implementation in Uganda focused on the sub-counties and farmers have had an opportunity to select budding enterprises or promising products. Many have taken up the gari project because it had these particular characteristics combined with a high market potential. The project implementers should capitalise on this to move the technology forward.

Presentation

By Fredrick Muhanguzi
MBADIFA, Uganda

Crop Production Technologies

Post-harvest, handling and marketing of perishable agricultural products using solar dryers

Mbarara District Farmers Association (MBADIFA) is a non-governmental organisation belonging to the farmers and working with farmers in Mbarara district, Uganda. MBADIFA works in partnership with women and youth groups, CBOs and NGOs.

“The project purpose was to increase the shelf life of bananas and other agricultural products such as vegetables, fruits and mushrooms.”



A close-up of a solar drier in use.

Project background and rationale

At the inception of the project Mbarara district had adequate food crops such as bananas, fruits and mushrooms. Production of these crops was high. Annual production of banana in the district was 13,200,000 tonnes of which 40 per cent (5,200,000 tonnes) were consumed at home, 35% (4,620,000 tonnes) was sold and 25% (3,300,000 tonnes) were wasted during peak production period (June – August).

The banana loss and wastage was because of poor post-harvest handling techniques. Some households had been drying their bananas on mats and roofs, thus exposing the product to poor hygienic conditions. In other parts of the country which do not have a favourable climate, demand was extremely high.

On the other hand, during the off-peak production period, the entire farming community faced an extreme scarcity of bananas. This led to acute malnutrition, especially in women and children.

With the introduction and expansion of solar dryer technology, farmers would have an opportunity of getting the food stuffs required for home consumption and selling through the year. That would increase farmers' incomes and general standards of living. The banana residues would be used as feed for livestock or decomposed to improve soil fertility.

Project goal

The ultimate goal of the project was to improve the standard of living of the rural people. The project purpose was to increase the shelf life of bananas and other agricultural products such as vegetables, fruits and mushrooms.

Objectives

The project had the following objectives:

- To train 8000 farmers (1000 households) to dry 70 tonnes of bananas during peak production periods by the end of 2005;
- To train 140 banana Special Interest Groups (SIGS) in the drying and processing of bananas by the end of 2005;
- To train 8000 banana farmers in the drying of alternative crops (fruits and vegetables) during off-peak production period by the year 2005; and,
- To train 20 marketing associations at parish and sub-county level.

MBADIFA's Partners and their roles

- KARI - Training in construction and processing;
- District Production Department - Provided subject matter specialists;
- DANIDA / TRIAS - Equipment, vehicles and premises for rent;
- NAADS - Demonstrating the technologies in areas outside the project reach; and,
- Local Councils - Mobilisation and sensitising.

Dissemination methods used

- Establishment of contact farmers, extension link farmers, field advisors as well as Parish Executive Committees (PEC) to provide the framework for effective

Presentation

By Fredrick Muhanguzi
MBADIFA, Uganda

Solar Drying Technology

farmers' learning and technology transfer process.

- Involving more women than men at the level of groups, contact farmers, extension link farmers and field advisors.
- Training, radio talk shows, newsletters, brochures, newspaper supplements, exhibitions/mini shows, exchange visits, drama and study tours.



Above: a packet of dried bananas ready for sale. On the right: Participation in the annual national agricultural shows was an effective means to disseminate the technology to the rest of the country.

Results and outcomes:

The following achievements were recorded by the project:

- 5040 farmers and 140 groups were reached directly with the technology;
- Up to 30,000 people from within and outside the project area are estimated to be aware of solar drying technology;
- 840 households actively used solar dryers;
- Four parishes within the project sub-counties and four other sub-counties are demonstrating and practising the technology despite their lack of coverage by the project;
- 20 local artisans have been equipped with construction skills;
- 3124 women were trained in banana drying and processing;
- The shelf life of products increased from five days to ten months or more;
- 152.4 tonnes of bananas have been dried by the end of 2005;
- 11.1 tonnes of other agricultural produce have been dried by the end of 2005;
- 21 more dryers were built by groups;
- 31 groups used income from the sale of dried products to buy goats (107 goats were bought); and,
- Three groups are rearing 38 local chickens.

Impacts

The project had the following impacts on the target areas:

- Each of the 840 households increased their incomes from Ushs 5000 to 90,000 per month;
- 61 farmer groups established a savings and credit component; and,
- Each of the 840 households were able to improve their nutrition through the year, meet their medical care, clothing, and basic household necessities. They also managed to join groups, make contributions and send children to school

Emerging issues

The following issues came up during the life of the project:

- Drying and processing of bananas has been considered by government and efforts are under way to establish one large banana processing plant in Mbarara.
- NAADS is promoting the drying and processing of bananas.
- 61 groups have initiated a rotational savings and credit component by contributing 40 per cent of their sales to the group rotational fund and 60 per cent is shared among group members.
- Banana farmers formed 20 marketing associations that undertook the promotion of banana dried products through demonstrations and use of the media.

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By Fredrick Muhanguzi
MBADIFA, Uganda

Solar Drying Technology



Members of MBADIFA admire a solar drier containing various food stuff in Mbarara district, Uganda.

Sustainability issues

On plans to ensure continuity of the project, the following has been undertaken:

- Farmer groups are continuing to construct more dryers for individual members through rotational savings and credit components;
- Artisans are well equipped with skills to support the scaling out of the technology; and,
- MBADIFA will continue to integrate some of the activities in the transfer of solar dryer technology in its future programmes.

Exit strategy

The following strategies have been laid out in preparation for project exit:

- MBADIFA will continue to provide banana drying and processing services to the registered farmer groups;
- One of the project partners, the local government, is implementing drying and processing of bananas through NAADS and Area Based Agricultural Modernisation Programmes (AAMP).
- MBADIFA is proposing to the MATF for an extension phase of activities aimed at increasing technological adoption, product popularisation and marketing.

Discussion and response from participants

Participants gave various responses to the presentation. AP member Mrs Mbise raised a number of issues with the project presenter. She was keen to find out whether MBADIFA had plans to disseminate the technology through mosques, the same way they had used for the parishes. In addition, she wondered whether they could consider entering the market through schools, the way gari project implementers had done.

The AP member was also concerned with the data provided and whether it corresponded with the overall project objectives. Lastly, she was curious about the cohesiveness of the partnership and whether MBADIFA would take the same approach if given another opportunity to do the project.

Joseph Oryokott, an AP member, commented about an interesting challenge farmers in the project area had shared with a visiting MATF team. They said that most households were finding it difficult to peel the bananas before they could be dried. They wondered whether it was possible for MATF to develop a technology for peeling! This challenge was apparently preventing them from obtaining sufficient quantities for drying.

Participants requested clarification on the pricing system being used by the project to sell processed bananas because of the cost-benefit analysis that was given. They noted that the analysis was not comprehensive enough because it did not include the running cost of machines and manpower, for example.

A subsequent question was raised concerning marketing and the issue of high demand for bananas and whether it could be quantified by the project implementers.

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By Fredrick Muhanguzi

MBADIFA, Uganda

Solar Drying Technology

This could help in establishing how much of it had been met by the project and how the remaining demand could be met.

Elizabeth Obanda of Africa Now noted that the figures provided in the presentation had indicated that 25% of the harvested bananas used to go to waste before the technology intervention. She was keen to find out whether the project implementers had measured how much of this wastage had been reduced by the solar drying technology.

AP member Prof Sarwatt, commenting on the issue of by-products from the project in the form of large quantities of banana peels, wondered whether these were being used as livestock feeds or simply being thrown away. He emphasised that “it was important to use by-products for other productive purposes.”

MBADIFA responded to the issues that had been raised. On the issue of using mosques for dissemination purposes, the presenter noted that muslims were an important part of the target communities and would therefore not be overlooked. He clarified that mosques had been used by the project as channels of dissemination.

On the issue of using schools as platforms of dissemination, as the gari and Makerere's orange flesh sweet potato projects had done, the presenter stated that this had actually been done. He cited as an example, a school visited by an MATF evaluation team which included AP member Eng Kaima. Such schools provided an important venue for carrying out demonstrations and also as market outlets for most of the products processed by the technology. However, he agreed with the participants that this had not been mentioned in his presentation.

The presenter, responding to the question of partnerships and cohesiveness, said that MBADIFA, if given another opportunity to continue with the project, planned to identify the most relevant partners. This would especially assist in popularising the technology through aggressive marketing.

The presenter added that relevant partnerships would also assist in overcoming certain challenges experienced such as policy issues. He gave the example of a time the project co-ordinators had interacted with various government officials when conducting a market survey. These were personnel from the prisons department, police, military and officials in the IDP camps in Lira district. These were potential areas that could use the technology to address food security.

On the issue of by-products arising from the project, the presenter clarified that the farmers were actually using banana peels to feed their livestock. Before the project was initiated, most used to be thrown away but after the project started, farmers were trained on how to use the banana peels.

The issue of cost-benefit analysis was also addressed. The presenter said that the solar dryers did not have any running costs. Each of the 140 farmer groups received a solar dryer, which was accessible to all members. The groups have schedules in place to guide the members on which day they can bring their produce for drying.

On the running costs, MBADIFA meets the milling machine costs at Ushs 15.00 per kilo. The solar dryers do not depreciate. In terms of quantifying the demand, the presenter clarified that this demand was currently about the technology rather than the produce. The produce would be quantified once marketing of the solar dried produce commenced.

“The reduction in banana wastage is yet to be quantified,” the presenter clarified. He elaborated that the project had nevertheless managed to increase the shelf-life of bananas from five days to ten months. There is still more potential to keep increasing produce shelf-life and reduce wastage of other perishables, besides bananas.

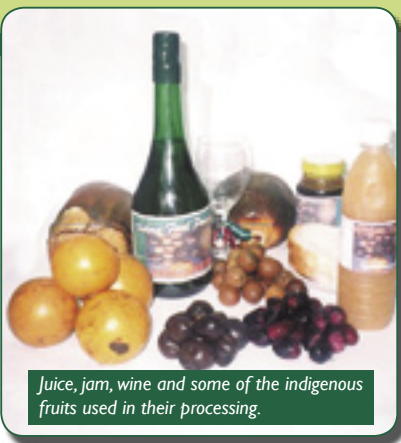
Presentation

By Jonathan E. Chiligati
ARI-Tumbi, Tanzania

Crop Production Technologies

Introduction of indigenous fruits processing technology to rural communities in Tabora, Uyui and Sikonge districts in Tanzania

“The project was started to raise rural standards of living by increasing family incomes and improving nutritional status through processing of indigenous fruits, thereby adding value to the fruits.”



Juice, jam, wine and some of the indigenous fruits used in their processing.

Project background

This project was conceived to address problems facing Tabora region and Tanzania as a whole. These problems constitute wide spread poverty, food shortage, malnutrition, HIV/AIDS and the degradation of renewable resources. 80% of the population lives in the rural areas.

A way was found to address some of these issues through a project introduced by the research institute ARI-Tumbi. The Tabora region is dominated by *miombo* woodlands with plenty of edible fruits. The utilisation of these fruits into value added products commenced in April 2004 with the development of a fruits processing technology by ARI-Tumbi.

Project purpose

The project was started to raise rural standards of living by increasing family incomes and improving nutritional status through processing of indigenous fruits, thereby adding value to the fruits.

Objectives

The project formulated the following objectives:

- About 20,150 (20%) of the households in Tabora, Uyui and Sikonge districts to be sensitised on the potential and importance of indigenous fruits by March 2006;
- 270 people to be trained on indigenous fruits processing, marketing and micro-credit management by March 2006; and,
- Two processing and marketing centres, one selling centre and a micro-credit scheme, to be established by March 2006.

Partners

These were the project partners and their roles.

1. ARI Tumbi - the host institution was:

- Co-ordinating the other partners;
- Overall administration including handling of finances;
- Organised and co-ordinated project activities (meetings, workshops, training and M&E);
- Provided scientific and technical staff for training in processing and dissemination of the technology; and,
- Logistical support for the project (transport, secretarial services, and communication services).

2. SIDO (Small Industries Development Organisation):

- Provided training in indigenous fruits processing;
- Training on micro-credit, entrepreneurship and business and marketing skills;
- Provided technical guidance on acquisition and operation of processing and packaging equipment.
- Provided technical support on micro-credit acquisition and management.

3. TAWLAE (Tanzania Women Leaders in Agriculture and Environment):

- Mobilised women group formation;
- Participated in the training of processing; and,
- Participated in market surveys, M&E exercises;

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By Jonathan E. Chiligati

ARI-Tumbi, Tanzania

Indigenous Fruits Processing

4. ICRAF (International Centre for Research in Agro-forestry);

- Assisted in project management and promotion through the production of leaflets;
- Linking the project with international organisations;
- Provided expertise and training on fruit processing technology; and,
- Participated in M&E.

5. Local governments of Tabora, Uyui and Sikonge districts;

They worked through their departments of Agriculture, Community Development, Cooperatives and Natural Resource Management. Their roles were on leadership training, seminars, workshops, awareness creation (product promotion) and field supervision of the project.



Magiri group processors explaining the processing procedure to a monitoring team led by MATF Manager Dr Lydia Kimenye during one of the monitoring visits to the village in 2004.

Dissemination methods used by the project

These were mostly group participatory approaches as follows:

- Training through demonstrations and practicals;
- Seminars, workshops, and exchange visits;
- Trade fairs and exhibitions;
- Promotion campaigns, community meetings, leaflets, posters, radio and TV advertisements; and,
- Local diffusion involving groups and individual farmers

Project outcomes

The following were the results recorded by the project:

- 18 processing groups, with a total of 270 members, were formed in the three districts;
- 409 people, including 29 men, were trained in processing indigenous fruits into juice, wine and jam;
- 72 processing group leaders were trained in group management, entrepreneurship and M&E;
- 90 processors participated in exchange visits and learnt aspects of group cohesion and sustainability, production, marketing and management of groups' revolving funds;
- Two processing centres and two selling centres were established in Tabora and Sikonge districts;
- Credit funds were established for all project processing groups and TShs 12,920,400/= (£ 7,278.76) was disbursed to group accounts. These funds are managed by the respective groups under supervision of their district community development offices;
- Over 30,000 people were sensitised on the importance of indigenous fruit juice, wine and jam through promotion campaigns in which 1,050 leaflets and 115 posters were distributed during community meetings. Other methods of sensitising were radio (Voice of Tanzania-VOT) and TV (Tanzania TV-TTV) advertisements which were aired four times per day for four weeks;

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ARI-Tumbi, Tanzania

Indigenous Fruits Processing

- Market surveys were conducted in three cities, Dares Salaam, Arusha and Mwanza;
- Over 40 processors participated at various trade fairs, sold their products and learnt new experiences;
- Mobilisation and support of processors groups to establish of the Association of Tabora Fruits and Vegetables Processors (*Muungano wa Vikundi vya Kusindika Matunda na Mboga Tabora - MVIUMATA*) which will oversee processors' groups;
- Some groups joined TAFOPA (Tanzania Food Processors association) and MVIWATA (*Mtandao wa Vikundi vya Wakulima Tanzania*).

The table below shows the most common indigenous fruits the project identified for processing

Scientific Name	Common Name
<i>Strychnos cocculoides</i>	Ntonga
<i>Vitex mombassae</i>	Ntalali
<i>Parinari curatellifolia</i>	Mbula
<i>Vitex doniana</i>	Furu
<i>Fracourtia indica</i>	Mbuguswa
<i>Sclerocarya birrea</i>	Ng'ong'o
<i>Syzium guineense</i>	Zambarau
<i>Adansonia digitata</i>	Ubuyu
<i>Tamarindus indica</i>	Ukwaju
<i>Mangifera indica</i>	Mangoes

Project impact

- Establishing and strengthening processors' groups that are confident and self managed;
- Diffusion of processing technology that led to the formation of secondary groups in villages including Misha, Inala, Sikonge, Tumbi and Mbola;
- The processors' income was raised by an average of TShs 30,000/= per family per month, reducing women's financial dependence thereby increasing their access to capital goods and social services such as education and health;
- Contributing to household food security, through promoting the use of fruits in local brewing (of wine) instead of using staple food e.g. maize;
- Improvement of nutrition for the processors and their families;
- Building leadership capacity among women processors;
- Changing habits of alcohol consumers in indigenous fruits processing villages, from local and illicit brews to indigenous fruit wine;
- Instilling the habit and discipline of financial borrowing and timely repayment;
- Inspiring women processors, and the community at large, to value and protect natural forests as these are sources of the fruits for their processing activities; and,
- Increased the awareness of a project village – Mbola in Uyui district to international organisations that led to its nomination as a **millennium village** for implementation of the United Nations Millennium Development Goals.

Emerging issues

1. Policy issues;

This project was in line with the government of Tanzania policy of poverty eradication, and its participatory group approach was in accordance with current policies. Almost all government development interventions are currently using the same concept (participatory and group approach).

2. Micro-credit administration;

- All groups received relevant training from SIDO prior to getting credit funds. The revolving funds were then disbursed to group bank accounts which were managed by the beneficiary groups through their loan committees, under the supervision of District Community Development offices.
- M&E visits revealed that all groups were performing quite satisfactorily with repayment rates between 64 and 100 per cent.

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By Jonathan .E Chiligati
ARI-Tumbi, Tanzania

Indigenous Fruits Processing

3. Marketing issues;

Processors were selling their products in their villages and in neighbouring towns of Tabora and Sikonge. This was conducted through village shops, town shops, local ceremonies and other gatherings. Other market avenues were regular open air markets and trade fairs.

4. Sustainability and exit strategies;

- All project partners agreed to continue supporting the groups by integrating project support into their work programmes.
- District councils were approached, in writing, to recognise the groups, register and support them through their annual budgets for women and youth groups.
- All groups were advised to formulate strategies for sustainability and indeed most devised convincing plans such as the establishment of alternative enterprises
- All groups were advised to join processors and farmers' networks such as TAFOPA (Tanzania Food Processors) and MVIWATA (Mtandao wa Vikundi vya Wakulima Tanzania)

Discussion and response from participants

AP member Mrs Mbise opened the discussion on a point of information for the workshop participants. She lauded the fact that the project had encouraged more preservation of the forests because the young men in the project protected "their" harvest portions in the forests. They did not allow any destruction or burning of the trees. The processors, who are mostly women, buy the harvested fruits from the young men. She also noted that it was encouraging that the project had promoted the growing of trees in every homestead.

On a point of clarification, the AP member mentioned that some of the fruits were not only indigenous but actually wild. The fruits also contained high medicinal properties that could cure many ailments. This aspect was currently under study at the research station, Horti-tengeru.

Going by the figures provided in the presentation, a participant was concerned by the low participation of men in the project. Out of 409 people that had been trained in the fruit processing, only nine were men. Was this deliberate on the part of the project co-ordinators to adopt a gender selective policy or did men have other economic engagements?

There was also a query by AP member Eng Kaima on the quantities required to meet market needs and the issue of safety certification. Had this been established by the project implementers?

The presenter responded by informing participants that over 50 species of potential wild fruits for processing had been identified from a survey carried out in 1999. Farmers were trained through the assistance of Sokoine University of Agriculture and ICRAF. He agreed with observations from participants about the conservation of the forests through harvesting by the young men. He said that this was part of the sustainability measures put in place for the project.

On the issue of fruit amounts harvested for the market, the presenter clarified that the project focus was on the income generation rather than the quantities from the fruits. He agreed with an earlier observation that the fruits had lots of medicinal properties. He gave an example of a fruit known as *Matonga* which had the same caloric value as ten oranges.

On gender participation, the presenter clarified that the nature of the processing, which involved lots of boiling, had contributed to the decline in men's participation. Traditionally, boiling of water or food was regarded as women's work, and this had played a role in discouraging the men from the processing. However, he was optimistic that this would be reversed once the men saw the economic benefits of the project.

Presentation

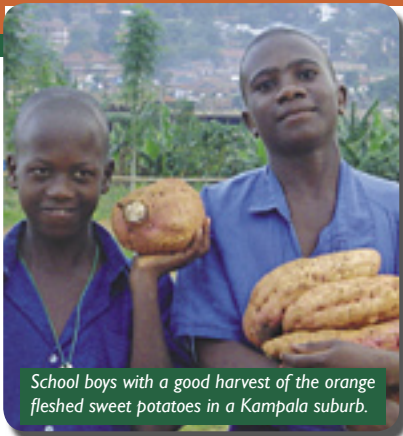
By Boniface Orum

Makerere University, Uganda

Crop Production Technologies

Promotion of orange fleshed sweet potato varieties through schools in urban and peri-urban communities of Kampala, Uganda

“Replacing the white fleshed sweet potatoes with orange fleshed sweet potato varieties, that are high in beta-carotene, would benefit over one million farming families in the urban and peri-urban areas of Kampala city.”



School boys with a good harvest of the orange fleshed sweet potatoes in a Kampala suburb.

Project background

Annually, between 10,000 and 60,000 Ugandan children die from vitamin A deficiency (VAD) related illnesses. Vitamin A is essential for sight and cell differentiation. VAD weakens the immune system, thereby increasing susceptibility to infection and illness. Deficiency also results in night blindness and, ultimately, blindness, growth retardation, damage of mucous membrane tracts and reproductive disorders.

Sweet potato is a common staple food for about 90% of Ugandan households and forms part of the daily menu. Replacing the white fleshed sweet potatoes with orange fleshed sweet potato (OFSP) varieties, that are high in beta-carotene, would benefit over one million farming families in the urban and peri-urban areas of Kampala city. On average, it is estimated that 100g of OFSP is sufficient to provide the daily vitamin A requirements compared to 6,000g of white fleshed potatoes.

In 2004, the Uganda sweet potato programme of NARO released two varieties of OFSP, *Ejumula* and *SPK 004* or *Kakamega*. Despite their high vitamin A content and high yielding and industrial potential, their dissemination and consumption remains limited partly due to lack of awareness and limited planting materials.

Project purpose

The OFSP project was therefore initiated to address food and nutrition security among poor urban and peri-urban communities who rely on farming as a livelihood strategy.

Project objectives

The following outputs were expected from the project:

- At least 500 families to adopt the growing of *Ejumula* and/ or *Kakamega* varieties on 1/10th of an acre each.
- Over 500 Rapid Multiplication Technique (RMT) plots of either variety established.
- At least 150 tonnes of *Ejumula* and/ or *Kakamega* roots harvested.
- Ten community-owned and managed vine multiplication plots/fields of *Ejumula* and *Kakamega* varieties established.
- Local community institutions to sustain the project strengthened and/ or established.

Partners and their roles

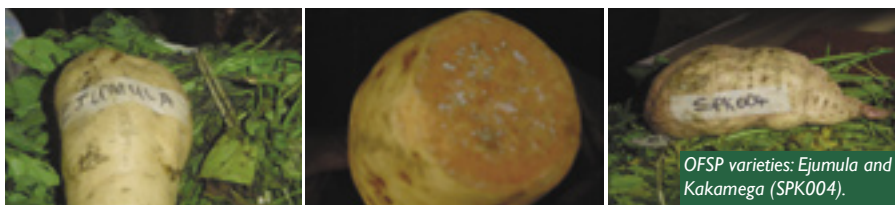
The project was implemented through a partnership involving the following organisations, each with specific roles as follows:

- **Makerere University, Department of Agricultural Extension/Education** - Responsible for overall co-ordination and provision of professional leadership in participatory planning, monitoring and evaluation, community institutional building and communication strategies.
- **NARO's Sweet potato programme of** - Provision of high quality planting materials, technical backstopping, TOTs and farmers on OFSP agronomy and post harvest issues.
- **International Potato Centre (CIP) - Vitamin A for Africa (VITAA)** - Responsible for technical backstopping, developing training and dissemination materials.
- **Urban Agriculture Department of Kampala City Council (UAD - KCC)** - Provide linkage to city authorities, policy guidance and framework on urban

Presentation

By Boniface Orum

Makerere University, Uganda



agriculture, health nutrition, political support and public extension services.

- **Joint Energy and Environment Projects (JEEP)** - Was responsible for community mobilisation and sensitisation, field training, implementation of school and community-based activities including project promotion.
- **Schools** - Eleven primary schools including one for the physically handicapped (six from Rubaga and five from Kawempe divisions) provided the training sites for the communities, teachers as TOTs, land for demonstration and RMT plots, and, most importantly, pupils as learners, future farmers, disseminators and agents of change.

Methodology

The project adopted the approach of reaching communities through schools. The schools acted as training and learning centres and hosted the demonstration and RMT plots. The project partners employed a number of participatory approaches as follows:

- Sensitising seminars;
- Experiential learning;
- Promotional and informational materials (e.g. banners, T-shirts, calendars, posters, video tapes, OFSP booklets, manuals and pamphlets);
- Exhibitions, music, dance and drama, community theatre;
- Farmer to farmer outreach using mentor farmers and trainers of trainers; and,
- Field days and exchange visits.

Results and outcomes

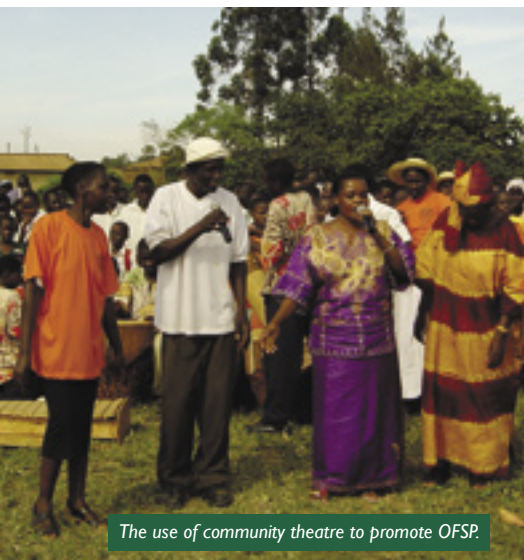
The project has achieved the following results and outcomes:

- Over 5,000 farmers have been sensitised on the value of OFSP as a food security and nutrition crop;
- Over 300 RMTs were established by individual farmers;
- About 600 farm families have grown and consumed OFSP;
- 50 RMTs were established by school pupils as individual projects;
- A total of 515 copies of TOT training manual in *Luganda* were published and distributed to TOTs, schools, farmers, partners and other extensionists;
- As a capacity building measure, the project has trained over 80 mentor farmers. These are being reinforced by 42 TOTs who were trained in general OFSP agronomy and production;
- Farmers have harvested and used over 300 bags of vines from the community owned demonstration and RMT plots. In addition, the schools and communities have sold over 200 bags of vines worth \$1,000 from their own fields and RMT plots;
- Over 90 tonnes of roots have been harvested and consumed by the farmers despite a drought that severely affected yields in two seasons;
- Ten school communities have formed associations or groups and have written community action plans as a strategy of sustaining their activities;
- The local politicians have appreciated the importance and role of urban agriculture as a food security strategy by urban and peri-urban families and most of them highlighted urban farming in their campaign manifestos;
- A new partner, Urban Harvest Kampala, joined the OFSP project and carried out an in-depth nutrition education among the participating schools in Kawempe division. The two-year Schools Nutrition Education Project was worth \$30,000; and,
- The level of understanding, experience and skills of OFSP partners in implementing an urban based community agricultural project has been greatly enhanced.

Lessons learned

These were the lessons learnt from the project:

- It takes time and patience to change a farmer's attitude towards accepting and adopting new technologies, especially when they've had negative experiences with



The use of community theatre to promote OFSP.



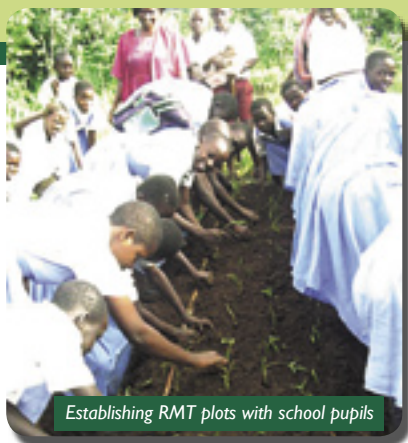
Promoting OFSP using dance and drama.

Presentation

By Boniface Orum

Makerere University, Kampala

“Urban agriculture is now recognised as a food security and livelihood strategy among the urban poor and is widely encouraged by urban authorities.”



Establishing RMT plots with school pupils



OFSP Vines ready for harvesting.

- previous technologies introduced from research stations;
- Working through schools has proved to be very successful because the farmers perceive the schools as neutral venues where they can freely discuss matters related to farming as well being able to access school land for agricultural purposes. The practical nature of the activities has enabled the agricultural teachers to give hands-on training to pupils;
- Successful team work requires transparent leadership, sharing of roles and responsibilities, participatory decision making, flexibility, mutual respect, and constructive criticisms (effective feedback mechanisms);
- Regular field monitoring using a good monitoring framework is crucial in collecting, analysing and reporting data; and,
- Timely provision of healthy clean vines is crucial and requires a multi-stakeholder approach so that risks (for example, disease or pests) are minimised.

Challenges encountered

Despite the achievements made, the following challenges were encountered during the course of project implementation:

- TOTs were over-stretched necessitating the training of mentor farmers to facilitate farmer to farmer extension;
- Land was a limiting factor to many peri-urban farmers; and,
- Timely provision of adequate healthy and clean vines to farmers was problematic partly because of the prolonged drought that caused the withering and drying of most vines.

Emerging issues

Some of the emerging issues from the OFSP project are as follows:

- OFSP was taken to rural areas and some peri-urban farmers have started growing it in rural areas where there is more land and greater need for Vitamin A;
- New partners including PLAN Uganda, The AIDS Support Organisation (TASO) and the Department of Food Science and Technology of Makerere University are exploring how to promote vitamin A consumption, with the Kampala City Council encouraging vegetable and OFSP production through schools; thus providing continuity for the project; and,
- Under the community institutional development activities, schools and community members have developed action plans to continue with the OFSP activities.

Sustainability issues

The project partners are hopeful that activities initiated will be sustainable because:

- The development of local farmer groups and co-operation between the different schools and communities was an important exit strategy;
- The farmers and pupils have been trained in OFSP agronomy, production, product development and RMTs;
- The partners and benefiting schools are established institutions (both public and private) that will continue implementing the principles and practices of OFSP particularly under the new syllabus which emphasises on agriculture;
- Institutional training has strengthened the capacity of community groups;
- Partner organisations are applying the knowledge, skills and lessons learnt from the project in their own work; and,
- A few individuals now grow OFSP on a commercial basis and supplement their income from the sale of vines and roots. Women are making OFSP products (mainly *chapatis*, doughnuts and *mandazis*) and are selling them to pupils and the general public.

Policy issues

Urban agriculture is now recognised as a food security and livelihood strategy among the urban poor and is widely encouraged by urban authorities. The major challenge is the ever diminishing available arable land due to rapid commercialisation of the city and its environs. Therefore, planners need to enforce environmental issues when it comes to planning residential and commercial premises to ensure that some land is left for trees and backyard farming. The current government policy is favourable to urban agriculture and promotion of alternative food based approaches, especially combating VAD.



Presentation

By Boniface Orum

Makerere University, Uganda

Orange Fleshed Sweet Potatoes

Recommendations

Based on the lessons learnt from the schools project, it is recommended that:

- Partners should continue working with policy makers to incorporate and institutionalise OFSP growing, consumption and marketing through schools to combat VAD; and,
- There is need to create functional linkages and strengthen the production and marketing chains between the urban communities and rural farmers so that the latter concentrate on production, while the former specialise in product development and value addition.

Discussion and response from participants

The discussion opened with a comment on how cost effective the programme was in urban areas. Participants were informed that the project had cost £60,000 to implement, and it had generated 90 tonnes of sweet potatoes at the end of the funding period. From these figures, the cost per kilo was essentially £5. The participants agreed that the cost-effectiveness had to improve for the project to continue profitably.

There was also a query on whether the project was selling or giving away the potato vines. A participant from Kenya was keen to find out about the Ugandan experience in dealing with the issue because farmers in Kenya participating in the push-pull project were reluctant to buy desmodium vines. They justified it using their cultural beliefs that stated it was wrong to buy planting seed.

On the way forward, one participant wondered about the nutritional aspect of the OFSP and what measures the project implementers had put in place to ensure the carotene part of the crop was preserved. This was especially critical at the post-harvest stage. The presenter was asked to clarify whether any promotional materials contained advice to farmers on how to preserve the carotene in the sweet potatoes.

The responses from the presenter followed thereafter. Regarding the observation about the cost effective aspects of the project, he cautioned that it would not be fair to look at the project simply in terms of cost returns. Its benefits were social and the positive effects would be felt in the future. The pupils were learning valuable lessons which would be applied over their lifetimes, influencing agricultural practices in the long run. He added that it would not be easy to quantify such a benefit at this stage.

On the issue of the vines and whether they were being sold, the presenter clarified that the project had actually given out OFSP vines through the farmer to farmer extension. Most of the farmers in the project had benefited from this initiative.

The presenter also addressed the issue of the nutritional education of the project. He cited the partnership with Urban Harvest, who were conducting a nutritional education project. The OFSP project was covered by this initiative through a study. The results were still being awaited for incorporation into the project.

The presenter informed participants that the project was already linking to markets through partnership with other organisations such as the International Potato Centre. The development of a teacher's guide on the growing of OSFP is also one of the methods the project is using to market the project in schools, providing resources to agricultural and science teachers.

Presentation

By Beatrice Pallangyo

ICRISAT, Tanzania

Crop Protection Technologies

Implementation and dissemination of “push-pull” habitat management strategies for control of stem borers and striga weed in maize based systems, eastern Tanzania

The technology makes use of natural plant chemicals that drive insect pests away from the maize crop (the “push”) and attract them to other host plants, which withstand attack better than maize (the “pull”).



Maize cob damage due to cereal stem borer infestation.

Project background

Maize is a major staple food to the majority of the Tanzanian population. The eastern zone produces only 8.4% of the maize produced in the country. The main production constraints include soil fertility depletion, droughts and pests. Two pests that cause the most damage to maize production are cereal stem borers and the striga weed.

In mid 2005, ICRISAT introduced the “push-pull” habitat management strategies in eastern Tanzania to address this problem. A two-year MATF funded project was thus started to establish “push-pull” trial plots in order to control cereal stem borers and Striga weed.

The “push-pull” technology

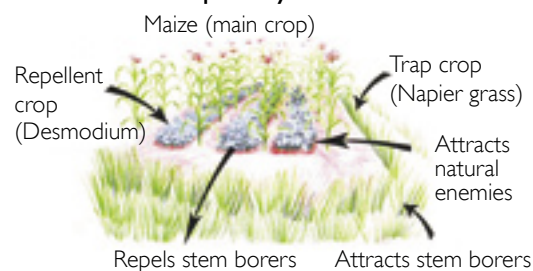
This is a novel approach to crop management that exploits the natural relationships between plants and insects. The technology makes use of natural plant chemicals that drive insect pests away from the maize crop (the “push”) and attract them to other host plants, which withstand attack better than maize (the “pull”).

An important repellent used in this technology is the forage legume *desmodium*. Besides being nutritious for dairy cows, it repels the insect pests that attack maize and substantially reduces damage from the destructive parasitic weed *Striga hermonthica*.

Stem borers are the larval stages of various species of moth and the major insect pest of maize and sorghum in eastern and southern Africa. They naturally feed on wild grasses, but when these are not available, they turn to cultivated maize and sorghum.

The large stems of maize plants provide an ideal habitat for stem borers. Maize losses to stem borers average 20-40% but can reach 80%. As a control method, pesticides are not only expensive, but are often ineffective since they cannot reach insects inside the maize stems. Moreover, they kill the stem borer’s natural enemies.

“Push-pull” system



“Push-Pull” habitat management set up (Khan et al, 1997)

The innovative solution was arrived at with the introduction of napier grass (*Pennisetum purpureum*) planted in border rows around a maize field. Acting as a “trap plant”, it attracts female moths to lay eggs on the grass rather than on the maize, thus providing a “pull”.

Napier grass has an ingenious way of protecting itself from the stem borers: the grass secretes a sticky gum, physically trapping the borer and preventing most larvae from completing their life cycle. The grass has the added value of not only being perennial, but it also provides a ready supply of fodder to feed farmer’s livestock.

(Source - *The Quiet Revolution: Push-Pull Technology and the African Farmer - A Gatsby Occasional Paper*)

Presentation

By Beatrice Pallangyo

ICIPE, Tanzania

Push-Pull Technology

Project objectives

The project embarked on the following objectives:

- To determine the relative contribution of stem borers and striga on observed maize yield gap;
- Test “push-pull” technology in farmer participatory trials;
- Capacity building of farmers;
- NARS and the NARES to conduct Integrated Pest Management (IPM) research on striga and stem borers; and,
- Evaluate the impact of “push-pull” technology.

Project partners

The following organisations played their role in the project partnership:

- ICIPE - Coordinator of the project;
- NBCP - Country Coordinator;
- Rothamsted Research (UK) - Technical information (infochemicals);
- Three Vikuge - Providing seeds to the project;
- TAHEA - Technology dissemination;
- ARI-Ilonga - Technical backstopping (on the Striga weed)
- MAFS Extension - Publicity



Striga infestation in a maize field.

Dissemination methods

The following approaches were used to disseminate the technology:

- Various meetings with stakeholders (farmers and partners);
- On-farm demonstration trials on how to manage desmodium;
- Training of farmers, researchers and extensionists;
- Organising farmers' field days;
- Participation in national agricultural exhibitions/shows;
- Mass media;
- Farmers exchange visits; and,
- Leaflets.



Farmers managing desmodium in the “push-pull” trial plots.

Results and outcomes

In the first year of the project implementation, ten farmers from two villages adopted the “push-pull” technology during the long rains season. In the short rains season, 26 other farmers from four villages started using the technology at their maize farms.

The second year of the project saw another 46 farmers from six villages using the technology. During the short rains, a total of 100 farmers from seven villages adopted the technology.

Presentation

By Beatrice Pallangyo

ICIPE, Tanzania

Push-Pull Technology



A "push-pull" demo plot: Maize intercropped with desmodium while napier grass is grown around the maize field.

The adoption of the technology impacted positively on farm productivity. There was an increase in quantity and quality of animal feed. Milk production went up to three litres per cow per day and through subsequent sales of milk and fodder, household incomes improved.

At an average production of 3 litres @ 400/= per day for 30 days, farmers were able to earn up to Tsh 36000/= per month from the sale of milk. Five round cut of napier would sell at 5000/= per cut, netting a farmer Tsh 25000/= per year.

The **impact** the "push-pull" technology had on livelihoods was seen through the following:

- Improved household nutrition due to availability of milk;
- Availability of income for school fees and small businesses; and,
- Less labour intensive on weeding.

Emerging policy and marketing issues

The following issues were observed from the implementation and subsequent adoption of the technology:

- **Policy;**

The technology was in tandem with the National Plant Protection Policy which stated, "Research will pay particular attention to natural and biological control methods of pest control which can be applied by farmers and livestock keepers and development of improved household storage" (Agriculture and Livestock Policy, 1997).

- **Marketing;**

Arrangements have been made to link the project farmers to Heifer Project International (HPI) for easy access to dairy cattle. Farmers are also encouraged to work in groups for access to loans and for purposes of marketing their produce. The dairy farmers are members of the Dairy Farmers Association.

Sustainability and exit strategies

The following mechanisms were put in place to ensure sustainability of the project:

- **Sustainability;**

Part of the income generated from the project is to be used for purchasing inputs. MAFS will continue with monitoring and providing technical backstopping where required. The knowledge gained is to be applied to other regions with similar cereal production constraints.

- **Exit Strategies;**

Plans have been made for the bulking of desmodium. Other exit strategies include capacity building through training.

Discussion and response from participants

Comments from participants commenced with a request for clarification on the technology's contribution to maize production in terms of data. A participant wondered about the criteria used to select the particular technology used and whether there were simpler answers to the problem of the stem borer infestation. He cited an example of striga resistant maize varieties as one option.

On the issue of maize production, the presenter clarified that the project had not been able to collect data from all the seasons but only from one season. They were therefore requesting an extension phase to be able to do so. However, the project recorded an 84% reduction in stem borer infestation.

The presenter also clarified on the choice of methods used by stating that the project aimed to reduce infestation using any available technology. In addition to the "push-pull" technology, the project was also using natural enemies of the stem borer such as the larval parasitoid, *Cotesia flavipes*.

Presentation

Samuel Njihia
KARI-Muguga, Kenya

Crop Production Technologies

Control of maize stem borers using the “push-pull” technology in central Kenya

Project rationale

Maize is the most important food crop in Kenya, and the potential yield is six tonnes per hectare. The average maize yield in Maragua, Murang'a and Kirinyaga districts is, however, two tonnes per hectare, and one of the main causes of the low yield are stem borers with a yield loss ranging from 20% - 80%. Among the control strategies, the “push-pull” technology was identified to be the most effective. The aim of the project was to demonstrate and disseminate this technology in order to reduce stem borer infestation and increase the maize yield within the selected districts.

“The aim of the project was to demonstrate and disseminate this technology in order to reduce stem borer and increase the maize yield within the selected districts.”



Stem borer damaged maize.

Key objectives

The specific objectives of the project were to:

- Reduce stem borer infestation by 25% and increase maize yields from two to three tonnes per hectare;
- Sensitise and train farmers on the application of the “push-pull” technology; and,
- Realise benefit/cost ratio of at least two after applying the technology.

Partnership

The project was implemented through partnership and linkage among several partners as follows:

- KARI Muguga - Undertook project implementation.
- ICIPE - Providing technological advice.
- Ministry of Agriculture, extension division - Farmer mobilisation, implementation of the field activities and routine monitoring.
- NGOs and CBO's - Provision of alternative extensionists and disseminators.

Methodologies used

The ToT model of training was used as the main methodology. The project was implemented as follows:

- Baseline survey to establish problem status and select districts/agro-ecological zones and farmers;
- Train and sensitise benefiting farmers and partners as field extension agents (farmer teachers) who will train others in their communities on the technology;
- Participatory setting up of bulking, technology and control demo plots;
- Participatory plot management and sampling;
- Dissemination and extension forums; and,
- Stakeholders' consultative forums, monitoring and evaluation.

Achievements

Through the diverse dissemination avenues, the “push-pull” technology was exposed to more than 2500 farmers with over 1000 adopting it at their farms.

Other achievements were as follows:

- Conducted six Rapid Rural Appraisals (RRAs) in three districts, sensitised 159 farmers and selected 25 contact farmers;
- 25 technology and control demonstration plots set up;
- Established 75 desmodium bulking gardens;
- Maize stem borer percentage incidence reduced by 29% in technology plots compared to the control plots ;
- Mean yield increased from one ton/ha before the project to six tonnes/ha at the end of project;
- 125 partial budgets conducted over the seasons;
- Benefit/cost ratio (average 2.2) achieved by farmers practising the “push-pull” technology;

Presentation

Samuel Njihia

KARI-Muguga, Kenya

Push-Pull Technology



Healthy maize in a typical "push-pull" plot.

- Significant number of the contact and adopting farmers had acquired extra dairy cows or goats; and
- Two extension and dissemination leaflets published.

Emerging issues and the way forward

The partners highlighted the following challenges and proposed future interventions:

- The two-year funding for the technology transfer was not adequate since it was season based and relatively new in central Kenya;
- During adaptation of the technology, napier stunting or head smut disease posed a problem;
- Poor soil nutrition management had a negative impact on the implementation of the technology;
- Farmers are reporting extra fodder as a result of the technology necessitating conservation, feed formulation and capacity building in dairy goats;
- Other technologies are required e.g. tube silage making, soil fertility improvement, dairy goat management, so as to add value and enhance effectiveness;
- A policy of mass transfers of extension staff hindered the training process;
- A zero tolerance policy to chemicals, linked to EurepGAP, favoured the technology which is environmentally friendly; and,
- During the project period, farmers observed that silver leaf desmodium is more tolerant to drought and termite attack compared to green leaf desmodium.

Sustainability and exit strategies

- Farmer teachers trained over the project period, will continue the dissemination of the technology;
- Well-established partnerships and linkages will ensure continued dissemination, monitoring and avail alternative sustainability partners of technology after the end of the project;
- "Push-pull" welfare groups formed by the farmers practising the technology will enable them to acquire certified seeds, fertilizers, desmodium seeds or vines, resistant napier varieties and attract new adopters;
- Desmodium and napier bulking sites have been established, enabling new farmers to adopt the technology;
- The multiple benefits from the technology accompanied by improved livelihoods has enhanced the popularity of the technology; and,
- Formation of dairy goat and milk marketing groups will encourage planting of more napier and desmodium.

Discussion and response from participants

The first query from the participants was on the issue of how the project managed to increase maize production from one ton/ha before the project to six tonnes/ha at the end of project. From the presentation, there was apparently no significant difference between the control plots and the technology plots, where incidence went down by 29%. Participants were also curious about the incentives offered to the contact farmers during the project.

The presenter responded to the queries by citing the RRA studies conducted before project implementation which enabled KARI Muguga to interact with the farmers. The farms were in bad shape due to stem borer infestation and poor soil management. On project commencement, contact farmers were identified who would later become teachers to other farmers. They were given optimum inputs for their farms, such as recommended fertilizers and maize for the given areas. In that way, the project was able to boost the crop production six times.

On the issue of incentives for the contact farmers, the presenter elaborated that the contact farmers, as technology adopters not only received valuable inputs for their farms, but they also participated in exchange visits and learning trips. This helped to motivate faster adoption of the technology at their farms, which they used as demonstration plots to teach other farmers.

Presentation

By Cecily Kabagumya
CIDev, Uganda

Crop Production Technologies

Clean yam planting material production in Kayunga district, Uganda

“The technology promoted involved immersing yams in a tank filled with hot water at a temperature of about 43-45°C for 20 minutes. This kills the notorious nematodes that spoil yams.”

Project rationale

Yam (*Dioscorea spp*) is a tuber crop gaining increasing popularity in Uganda, particularly with the introduction of new improved cultivars from West Africa. Despite this, nematodes such as *Meloidogyne spp* and *Pratylenchus sudanensis* pose a potentially serious threat to increased yam production. The clean yam production project in Kayunga district started in February 2004 with the aim of supporting 400 farmers in four sub-counties (Busaana, Wabwooko, Kayonza, and Kayunga) to produce clean yam planting material for improved food security.

Objectives

The project set out to achieve the following:

- Promote hot water treatment technology among 400 farmers.
- Provision of clean yam planting materials.
- Train and support farmers in order to participate in the implementation and monitoring of their farm activities.
- Build farmers technical capacity in production of clean yams.

The technology

The technology promoted involved immersing yams in a tank filled with hot water at a temperature of about 43-45°C for 20 minutes. This kills the notorious nematodes that spoil yams. Treated yams are then chopped into pieces of about 500g, treated with ash against re-infection by nematodes, and then planted.

Partnerships

CIDev implemented the project in partnership with IITA, INED, Kayunga district local government and farmers in the four sub-counties.

Methodology

The project used the following approaches during implementation:

- 400 farmers actively participated in project implementation and monitoring;
- Clean yam planting materials technology introduced and adapted in the four sub-counties by the targeted farmers;
- Farmers utilise technical skills on hot water treatment of yam tubers;
- 16 farmer groups establish nurseries that generate and maintain clean yam planting materials; and,
- Socio-economic impact assessment conducted to determine if the technology undertaken is a basis for further replication and dissemination.

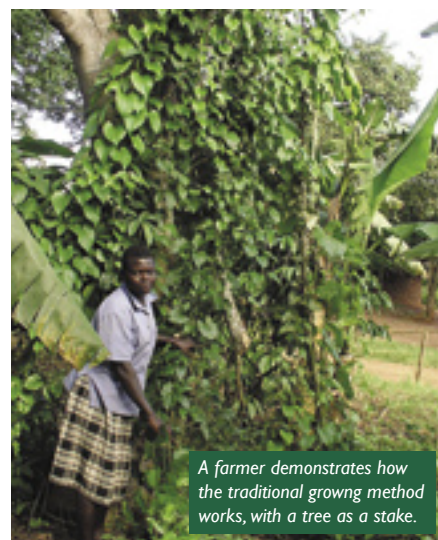
Achievements and outcomes

These are based on the six main project objectives as follows:

Output 1

400 farmers actively participating in the project implementation and monitoring:

- 16 farmers' groups, each with 25 members, formulated and actively participated in the project activities;
- Four sub-county committees were established; each with two representatives;
- A district committee of eight members, with two representatives per sub-county



A farmer demonstrates how the traditional growing method works, with a tree as a stake.

Presentation

By Cecily Kabagumya
CIDev, Uganda

Clean Yam Planting Material



Bicycles, ready for collection by Community Agricultural Advisors (CAAs).



A clean yam garden using sustainable agricultural practices.



A demonstration of the hot water tank.

was formed;

- 32 Community Agricultural Advisors (CAAs) selected, trained, and facilitated with bicycles; and,
- Four sub-county level farmers' associations were formed, and each of them drew up a constitution for their associations.

Output 2

Clean yam planting materials technology introduced and adapted:

- Four hot water tanks were purchased, one tank per sub-county, and all farmers acquired the knowledge of using the tanks; and,
- At least 372 farmers have skills and knowledge in sustainable farming and yam agronomy, and are adopting other modern and sustainable agricultural practices.

Output 3

Farmers utilising technical skills:

- 140 bags of yam seeds were distributed to the 48 nurseries and 11 demonstration plots;
- New improved cultivars, the Nigerian and the Mbale water yams, were introduced;
- 50 farmers outside the project are using the technology.

Output 4

Nurseries established to generate and maintain clean yam planting materials:

- 12 nurseries per sub-county (48 overall), with 10,800 yam seedlings, were established; and,
- After the harvest, four new demonstration plots with a total of 1400 plants were re-established by farmers.

Output 5

A socio-economic impact of the hot water treatment technology is undertaken as a basis for further replication and dissemination:

- Two radio presentations;
- One district-wide agricultural show;
- Two exposure visits for 120 farmers was organised;
- A variety of dissemination materials were produced in local language and English;
- 32 CAAs trained and provided with bicycles;
- Farmer groups are now training fellow farmers; and,
- The district has committed Ushs 2M for extension to two more sub-counties.

Lessons learnt

The implementers identified the following lessons from the project:

- The Participatory Baseline Survey at the beginning of the project helped establish relevant stakeholders, and their socio-economic status, and relevant environmental concerns;
- Organising farmers groups helped build cohesion, and co-operation among the farmers, and eased project implementation;
- Establishing and empowering community structures (committees and CAAs) at different levels ensures co-operation, acceptability and sustainability of the project.
- Stakeholders participation in activities e.g. monitoring, mobilisation; open and

Presentation

By Cecily Kabagumya
CIDev, Uganda

Clean Yam Planting Material

regular communication foras among different partners, improves relationships, co-operation and commitment. Using existing structures enables project acceptability by communities;

- Defining of roles of different partners, in terms of co-ordinated implementation, effective follow-up and feedback systems, was crucial to keep them focused and committed;
- The results of the hot water technology treatment led farmers to advocate for the project; and,
- The project did not achieve its target of having each farmer sell 70 bags by end of the project because the time period was too short to realise such a big harvest and do collective marketing.

Key challenges

These were as follows:

- Weather conditions in the area;
- A wide-spread problem of termites;
- Heavy tanks - Transportation was difficult, and filling them with water was tedious;
- Gas use cannot easily be gauged; and,
- Due to relatively high poverty levels, contribution of 50% by CAAs to the bicycles failed.

Way forward

The partners realised that the project required more than two years to move from seed multiplication to marketing. An extension of the project is therefore necessary to co-ordinate farmers for increased production and out-scaling to other areas.

Discussion and response from participants

Participants responded to the presentation with comments on the costs of the hot water tanks. A participant was keen to find out whether the tanks were bought using a seed fund or a loan. In addition, the presenter was asked to clarify whether the farmers were paying to use the tanks.

Concern was expressed regarding the cost of the gas used by the hot water tanks. One participant wondered whether it would have been possible to utilise more locally available and appropriate technology to do the same job. There was also a query regarding increase of productivity. Participants were keen to hear from the presenter whether this had changed with the CIDev promoted technology as compared to the traditional method.

On the issue of yam productivity, the presenter informed the participants about the differences noted in the two methods. She said that the traditional method of planting yams produced smaller yams than the new technology. An 8 kilo yam from the hot water treatment technology can produce up to 10 yams, each being 500 gms. The traditional method can produce one yam, smaller than the ones from the hot water tank technology. Productivity was therefore much higher for the technology as compared to the traditional method.

The presenter addressed the issue of gas costs explaining that it remained a challenge for CIDev, which has been providing the gas. The groups were addressing this through established constitutions that stipulated a regular monetary contribution from each member. After the harvest, each farmer also has to contribute five yams to the group. The sale of these yams helps the group buy more gas and pay transport for the tanks.

On the recommendation of using alternative sources of energy rather than gas, the presenter clarified that the most viable option would be firewood. Using this source would be problematic in terms of temperature control since the water is meant to be kept at a constant temperature for 20 minutes. The presenter finished by explaining that the groups contributed 10% to purchase the tanks with CIDev paying the balance using MATF funding.

Presentation

By Semaganda Richard

Luwero District Farmers Association
(LUDFA), Uganda

Crop Production Technologies

Promotion of vanilla production in Luwero district, Uganda

Project rationale

Vanilla production in Luwero district was very low and its economic value unnoticed, with farmers lacking the agronomic skills to produce high yields. The aim of the project was to improve the vanilla management skills of the farmers in Makulubita, Zirowe, Kasangombe and Bamunanika sub-counties in order to increase the income of small-scale farmers through vanilla production.

Key objective

The main objective was to improve the skills of 100 vulnerable farmers groups of youths, women and men in proper vanilla agronomic practices such as hand pollination, spacing and staking. The project started in February 2004 and ended in April 2006.

Methodologies used

These were:

- Training of farmer trainers, LUDFA staff and local government staff to train farmers in the district;
- Establishment of demonstration gardens to aid in the training process and the promotion of proper management practice to neighbouring communities;
- A study tour to enhance farmers' knowledge and skills in vanilla management;
- Production and distribution of a handbook on vanilla management techniques; and,
- Distribution of vanilla vines grown on stake trees known as *Jatropha cacu*. Stakes were planted at a spacing of 8ft x 8ft giving a total plant population of 1,111.

Achievements

The vanilla production technology was well understood by farmers as a new highly paying enterprise, which resulted in increased acreage of vanilla.

The main achievements were as follows:

- 108 vanilla contact farmers with 35 vanilla plants in their demonstration plots;
- Ten farmer trainers (TOTs), who included three LUDFA staff and seven local government staff, were trained to be able to train farmers within the district;
- 1000 vanilla production handbooks were printed in the local language and distributed to farmers;
- 260 farmers participated in a study tour;
- 846 farmers were trained in vanilla production; and,
- 713 farmers have received and planted vanilla vines through the project and these farmers have high hopes of harvesting at least four kilos of fresh vanilla beans after two years.

Lessons learnt

The following lessons were learnt through the duration of the project:

- The group approach has been cost effective by ensuring community mobilisation for training;
- The contact farmers' gardens served as learning centres and enhanced the technological transfer of proper agronomic practices for both group and non-group members within the community;
- Vanilla management practices such as mulching and organic manuring have enhanced soil fertility and performance of other component crops such as coffee and banana; and,
- The wise selection of partners/collaborators enhanced back stopping of the project during tough times.

“The vanilla production technology was well understood by farmers as a new highly paying enterprise, which resulted in increased acreage of vanilla.”



Flowering vanilla pods.

Presentation

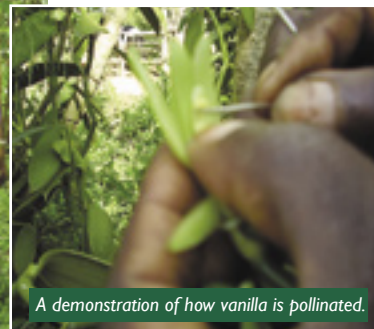
By Semaganda Richard

Luwero District Farmers Association
(LUDFA), Uganda

Vanilla Crop Production



Vanilla farmers in Luwero admire their crop.



A demonstration of how vanilla is pollinated.

Key challenges

The main challenges were as follows:

- The project targeted only LUDFA members yet there were other farmers in the community with interest in vanilla growing;
- The vanilla production technology requires intensive labour in mulching and manuring yet the project could not afford to supply such materials to farmers;
- The vanilla crop requires intensive care during dry weather. Farmers have to plant shade trees and do thick mulching; and,
- During project inception, the price of vanilla was very high and thus raised the morale of farmers to join vanilla production, but towards the middle of the project, the price fell down causing some farmers to pull out.

Vision for sustainability

The project's sustainability will be ensured through the following methodologies used:

- The 50% down-payment for vines will be used to supply vanilla vines to members within the groups so as to increase production;
- Vanilla farmers groups to be empowered to pool and market together their produce to avoid middlemen; and,
- LUDFA is working with the district local government to avail vanilla processing knowledge to farmers in order to enhance the shelf life of vanilla harvests before a buyer is located. But most important is the need for a vanilla collaboration and processing centre to be located within the district since none exists.

Discussion and response from participants

AP member Mrs Mbise commented on the issue of vanilla price fluctuations in the world market and the labour intensive nature of growing the crop. She expressed hope that "maybe the Ugandan government would intervene, just like in the banana project."

Other participants noted the fact that Madagascar is still a dominant supplier of vanilla to the world market, and that there was need for the LUDFA project to look beyond the immediate markets. The project should focus on its competitive edge, which is the favourable climate found in Uganda. Other viable options that could generate income for the farmers would be to think about processing part of the crop. In addition, clarification was sought on the revolving fund and how it would be sustained at the close of the project.

The presenter responded by acknowledging the observation that the Uganda vanilla had a distinct advantage over other growing countries in terms of the climate. He added that the crop's market was still assured in the global market due to better flavours caused by extended sunlight exposure. The presenter also agreed that growing the crop was labour intensive due to the processing or curing of the vanilla beans. LUDFA had made plans to purchase curing drums to ease the process and increase the vanilla shelf-life. On the question of sustainability, farmers were contributing 50% to the revolving fund and this had increased commitment to the project.

Presentation

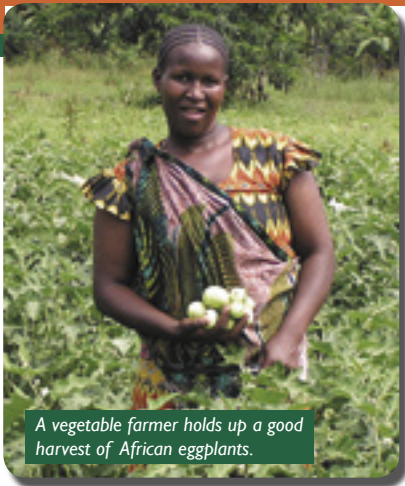
By Dr D. Silue

AVRDC - World Vegetable Centre

Crop Production Technologies

Empowering small-scale and women farmers through production, seed supply and marketing of African indigenous vegetables in East Africa

“The main achievement was that improved varieties of nightshade, amaranth and African eggplant received an adoption rate of over 70%, with the market demand for introduced varieties outstripping supply.”



A vegetable farmer holds up a good harvest of African eggplants.

Project rationale

The aim of the project is to alleviate malnutrition and poverty through improving sustainable production, quality, seed supply and marketing of African Indigenous Vegetables (AIVs) (amaranth, nightshade, African eggplant, and okra) in East Africa. The target areas were mainly in the Kiambu district in central Kenya and Arusha region in Tanzania.

Key objectives

The main objectives of the project were as follows:

- Increase awareness on the production, marketing and utilisation practices of micronutrient-rich AIVs;
- Implement sustainable production and seed production technologies to increase yields, productivity and seed supply to target groups; and,
- Improve marketing opportunities and channels for target producers.

Methodologies used

The following approaches were used during project implementation:

- Baseline surveys to appraise farmers' practices and skills, commodity value chain, market supply and demand, evaluate consumption trends, and determine production constraints of target AIVs;
- Trainers training course on indigenous vegetable crops production and marketing;
- On-farm and seminar training courses on AIVs production, processing and utilisation;
- Multiplication and distribution of seeds of selected micro-nutrient-rich target AIVs;
- Equip target groups with food preparation, processing and preservation technologies;
- Disseminate processing, preservation and utilisation techniques of selected AIVs to reduce post-harvest losses, improve marketing and increase consumption; and,
- Increase the capacity and technical knowledge of NARES, private sector, NGOs, women groups and farmers to produce, process, market and utilise AIVs.

Achievement

The main achievement was that improved varieties of nightshade, amaranth and African eggplant received an adoption rate of over 70% with the market demand for introduced varieties outstripping supply. Other achievements were as follows:

- 363 and 172 questionnaires administered in Tanzania and Kenya, respectively, to farmers, intermediaries and consumers;
- New technologies on production practices and recipes have been disseminated and adopted in over 50% of the targets areas;
- Trainers training course on indigenous vegetable crops production and marketing was successfully implemented on May 23-30, 2004 at AVRDC, Arusha, Tanzania;
- Two to three-day special skills training courses on AIVs production, processing and utilisation were held with over 400 people trained;
- Brochures, leaflets, posters and training materials have been developed, printed and distributed to thousands in Kenya and Tanzania;
- Radio programs have been transmitted on Kameme FM and Kenya Broadcasting Corporation (KBC) with over 1 million households reached;
- 1,000kg of target crops have been multiplied at AVRDC and then distributed;

Presentation

By Dr D. Silue

AVRDC - World Vegetable Centre

African Indigenous Vegetables



Popular African indigenous vegetable varieties. from left: amaranthus, cowpeas, eggplant and nightshade.

- Seed companies (e.g. Kenya Seed, Kibo Seed and Alpha Seed) and farmers have multiplied AIVs seeds and started supplying farmers with seeds to meet the demand;
- Marketing channels and outlets have been linked to farmers and women groups. Supermarkets in Kenya are receiving AIV supply through women groups and mixed farmer groups;
- The volume of AIVs sold in the two-year project period is estimated to be over 9,000 tonnes in Kenya with estimated market value of Ksh 90 million at informal market prices or Ksh 150 million at formal market prices;
- Recipes, processing and preservation technologies documentation has been disseminated to target groups in Tanzania and Kenya; and,
- Continuous on-farm and seminar training are conducted regularly in Kenya on indigenous vegetable production, marketing and utilisation.

Challenges

The main challenges were:

- Negative altitudes and cultures;
- Pest and Disease Infestation;
- High market demand and low supply;
- Drought;
- Unreliable transport means;
- Scaling-up; and,
- Seed production.

Lessons learnt

The following lessons were learnt in the course of the project:

- Adoption rate of technologies and varieties differ from one region to another and appears to be culture specific;
- AIV is a very suitable produce to use for development of women at group and individual level;
- For smallholder farmers to compete effectively with large companies and large scale farmers, they need to have enhanced capacity and take advantage of collective sales and scheduled production that can lead to continuous supplies;
- The inclusion of okra as a target crop was not well thought out;
- Organisation of farmers into business support groups is a drawn out process. The cohesion of these groups in Tanzania has been slow; and,
- The use of information communication technology (especially mobile phones) is very important in marketing.

Conclusion

- The project has been very successful and targeted goals were overshoot in many areas.
- The commercialisation of AIV gives an opportunity for small-scale farmers to have a high impact on poverty alleviation, dietary diversity and better nutrition.
- The technologies disseminated through Family Concern and AVRDC have been of great benefit to farmers and NARES.
- Demand for African leafy vegetables has grown by 135% in Kenya.
- AIV farming has also proved to be one of the fastest sources of income due to the short growing period of vegetables and less capital /inputs requirement.
- Inquiries on regional and export markets have been made by some exporters and this has created a high possibility of full commercialisation and upsurge of production with new opportunities for both fresh and dried AIVs.
- The production, marketing and utilisation of these vegetables can complement the nutritional requirement of the poor and the immuno-compromised members of

Presentation

By Dr D. Silue

AVRDC - World Vegetable Centre

African Indigenous Vegetables

rural communities.

- The institutionalisation process of seed production and supply is already taking root with seed companies coming into the process.
- Attitude toward consumption of these vegetables has greatly changed, especially in the last two years, due to high publicity and consumer education.

Way forward

- Scaling-up: due to the higher demand than supply (selective approach in choosing more groups).
- Market linkages: to link newly formed groups to the markets to enhance adoption of technologies transferred and solve the issue of low supply.
- Factoring: to support market embedded services (e.g. transport and credit period).
- New territories: due to the increase in demand and popularity of the produce, scale-up to other zones. Strengthen groups and form business support units.
- Strengthen the seed supply system: there needs to be an effort from the Tanzanian and Kenyan national regulatory bodies, such as TOSCI and KEHPIS, to create a national policy for quality standards of indigenous vegetable seeds.
- New varieties of vegetables: there is a need to introduce other vegetable varieties to create a wider market option for producers.
- Awareness creation: to continue with awareness creation on production, preservation and marketing of AIVs and banana; and,
- The wise selection of partners/collaborators to enhance back stopping of the project during tough times.

Discussion and response from participants

The MATF manager, Dr Lydia Kimenye opened the discussion with a query on whether the dried vegetables were getting into the market. Thereafter, there was a question on the issue of seeds and their availability, from MATF's Monicah Nyang'. AP member David Hopkins was keen to establish how AVRDC had overcome the issue of VAT, especially in regard to the supermarket outlets.

The presenter responded by informing participants that the project had not established a formal system of supplying the AIV seeds to farmers. However, there were indications that more seed companies were starting to produce the seeds in reaction to market demand.

On the question of whether the dried vegetables were reaching the markets, the presenter said that the market was limited for that variety. Reasons for this range from negative perceptions to potential niche markets being filled by other produce. He explained that new interventions were needed in the informal markets to enable farmers to sell their dried vegetables.

The presenter went on to explain that supermarkets were selling the vegetables without the VAT because the produce was exempted by law. There were more requests from the participants for the baseline study to show more information regarding demand, quantities of AIVs produced from the project, the kind of markets available for the produce and the location of the farmers.

Family Concern's Michael Mbaka responded to the requests. He mentioned that most farmers were located in the rural areas of Arusha, Tanzania and Kiambu district in central Kenya. He explained that the baseline study had also carried out a consumer survey that showed negative attitudes towards indigenous vegetables. "The consumer demand was found to be potential, but by raising awareness on AIV nutritional benefits, this potential was realised," he added.

The AIVs produced from the project met only 40% of the demand, which still remains higher than the supply. "This demand has been measured in supermarkets such as *Uchumi*, a major outlet where lots of promotion has been carried out," he clarified. Informal markets take over 70% of the vegetables.

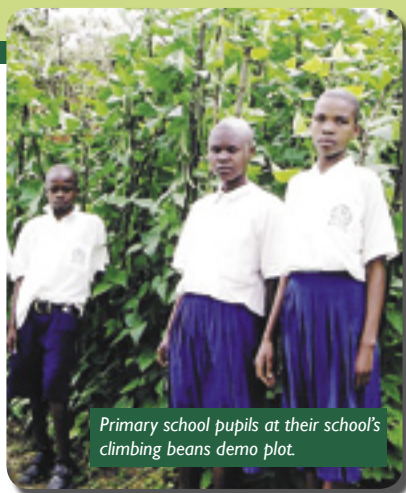
Presentation

By Festo Ngulu
ECABREN, Tanzania

Crop Production Technologies

Achieving wide impact with climbing beans and agro-forestry interventions in the Tanzania highlands: a win-win combination

“The main achievement of the project was to promote more productive and environmental friendly climbing bean technologies.”



Primary school pupils at their school's climbing beans demo plot.

Project rationale

Agricultural productivity in the highlands of Tanzania is declining and poses a serious threat to household livelihoods. The highlands are densely populated, average farm size is less than an acre, intensive mixed farming is common, and land degradation is on the increase. To counter this, ECABREN implemented a project to promote more productive and environmental friendly climbing bean technologies in north-eastern and north-western Tanzania regions.

Partners and their roles

The project sought partnerships with strategic stakeholders in order to capitalise on synergy and institute sustainability mechanisms right from the early stages of the project. Key partners and their respective responsibilities were:

- District Agricultural and Livestock Development Officers - Identification of project sites and follow up;
- Himo Environmental Management Trust Fund (HEM), Himo Moshi - Training on tree nursery management and links to tree seedling producers;
- Mediae Company Tanzania, Arusha - Publicity for the project;
- Maruku Agricultural Research Institute (MARDI) - Co-ordinated field activities;
- Adventist Development and Relief Agency (ADRA), Usa River, Arusha - Linked the project with village governments;
- TOSCI, Arusha - Training of small-scale bean seed producers and inspection of bean crop; and,
- Community Habitat Environmental Management (CHEMA) - Linked the project to the established farmer groups in Karagwe district.

Key objectives

The key objectives of the project were:

- Disseminate and promote elite climbing bean varieties to 35,000 households in the highlands in six pilot districts;
- Promote improved multipurpose agro-forestry species for fodder, stakes and soil fertility conservation; and,
- Establish institutional linkages for promoting climbing bean technology.

Methodologies used

The following methodologies were used to implement the project:

- Pre-testing of 18 elite climbing bean lines from Rwanda. Identification of 12 lines;
- Stakeholder meetings among partners;
- On-farm evaluation and ten field days to assess the 12 varieties planted on 189 on-farm sites;
- Publicity campaign using mass media and printed media;
- Exchange visits to farmers in Rwanda and Kenya; and,
- Community based bean seed and tree seedling production. Supply of starter seed to seedling producers and seedlings to farmers.

Achievements

The main achievement of the project was to promote a more productive and environmental friendly climbing bean technologies. Indicators of these achievements include:

Presentation

By Festo Ngulu
ECABREN, Tanzania

Climbing Beans

Below: a farmer in Bukoba district inspects her growing beans. Right: a women's group in Lushoto district at their demonstration farm.



- 66 farmers trained in community-based bean seed and tree seedling production;
- Selection of climbing beans GI 106, CAB19 and Flor de Mayo by the farmers;
- 8220 seedlings of *Calliandra* and *Leucaena spp.* distributed to 168 farmers;
- 50 seed packets of these varieties disseminated to 25,662 farmers;
- Yield potential for the climbers ranged from four to eight tonnes/ha under irrigation versus two to three tonnes/ha for bush types;
- Technology is spread to districts outside the project area such as Ngara and Biharamulo;
- The importance of staking accepted by farmers; and,
- Community seed production initiated. Two small-scale farmers registered with TOSCI produced 270 Kilogrammes of quality declared seed.

Challenges

The main challenges were the continued promotion of community seed production to support conventional seed system, and the marketability of seedlings from the fodder species. The drought had a negative impact on tree nursery establishment.

Lessons learnt

The following lessons were learnt:

- Two-year term for a project of this nature is too short to accommodate integration of an impact-tailored exit strategy;
- The multi-channel technology dissemination (i.e. farmer-to-farmer, field days, radio programs, etc.) approach is a fast-track model for reaching targeted beneficiaries in remote areas; and,
- Early engagement of targeted end users in the evaluation process creates a sense of ownership of the technology, stimulates creativity and bright prospects for impact.

Way forward

- Extend the project for one more year, using the unspent balance of the approved funds.
- Institute an impact-oriented exit strategy focused on sustainable seed availability.
- Engage with more partners particularly in agro-forestry, seed production, and marketing or entrepreneurship.

Discussion and response from participants

The participants comments were mainly concerned with the issue of co-ordination within the project, considering the large number of 35,000 targeted beneficiaries. They wondered how the project implementers had gone about the task. Other concerns were on the issue of seed packaging and supply during the project period.

The presenter explained that project co-ordination was enhanced through effective collaboration with schools, village governments and farmer groups. A stakeholder meeting was also organised at project commencement to raise awareness, and this was instrumental in enhancing co-ordination. On the issue of the seeds, he explained that seed packets contained 50 seeds and that there was high demand for the same during the two-year project. Supply was co-ordinated by all project partners.

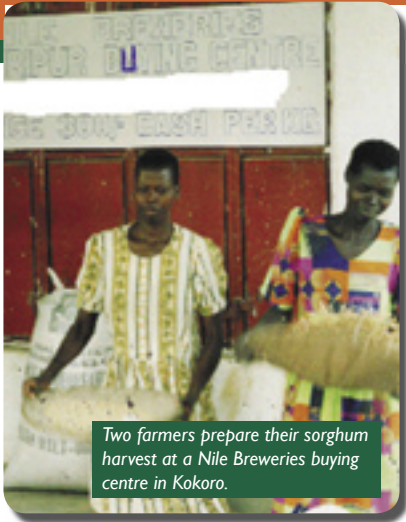
Presentation

By John N. Watenyeli
Caritas Tororo, Uganda

Crop Production Technologies

Farm production and distribution of *Epuripur* sorghum variety to increase household income in Pallisa district

“331 direct beneficiaries (92%) of targeted farmers are now producing and distributing improved *Epuripur* seed.”



Project rationale

Dissemination of on-farm production of *Epuripur* improved sorghum variety in the sub-counties of Kakoro, Kabwangasi and Kamonkoli in Pallisa district, Uganda, in order to improve food security and income at the household level.

Objectives

The key objectives of the project were:

- Promote on-farm production and distribution of *Epuripur* improved sorghum variety through community-based seed multiplication system;
- Improve farmers' knowledge of better crop management;
- Strengthen linkages between various stakeholders; and,
- Improve on food security and income at household levels.

Partnerships

On the part of partnership and linkages in the project implementation and achievements, the following organisations were involved:

- SAARI - Seeds provision, training, supervision, monitoring and report writing;
- District local government (extension officers) - Extension services, supervision, monitoring and marketing.
- Caritas Tororo - Planning, sensitising, modernisation, supervision, monitoring, processing inputs, discrimination, project management and report writing.
- Africa 2000 Network (A2N) - Assistance with planning, sensitising, training, supervision and monitoring.
- Nile Breweries Limited (NBL) - Provided a ready market.

Methodology

The dissemination methods used included community participatory approach through training sessions, public meetings, extension staff, transparent progress reports, mass media, churches, mosques and visits to production farms.

Achievements

- 331 direct beneficiaries (92%) of targeted farmers are now producing and distributing improved *Epuripur* seed.
- The farmers have formed *Epuripur* growers associations, which are now 18 in number with an average of 20 members in each association. Seven of the associations have opened and operating bank accounts.
- Production rose to 12,800kgs in the first season, and last year stood at 135,107 Kgs.
- During the sale of the crop, no farmer's seeds were rejected indicating that 92% of the participating farmers had improved their knowledge in better crop management.
- Over 190 homes (at least 53%) out of 360 showed some improvement in their income levels (37 farmers bought bicycles, 22 bought iron sheets for housing, eight started retail shops).
- The micro-credit system established to assist farmers purchasing equipment has proved a success with the farmers and they have decided to pay a small interest of Ushs 10,000 a year to ensure that the scheme is sustainable.
- Farmers now supply seeds to Caritas Tororo at the beginning of every other year, which are then supplied to other farmers.
- Convenient points or centres were established allowing farmers to link up and collect their produce together, to sell in bulk to Nile Breweries Limited.

Presentation

By John N. Watenyeli
Caritas Tororo, Uganda

Epuripur Sorghum

Sustainability

To ensure the sustainability of the project, the following aspects were implemented:

- Training of community based trainers, who are permanent residents in the project area, to train other farmers;
- Formation of Growers Associations and Community Based Seed Organisations (CBSOs);
- Ownership of the project by the farmers and the willingness to pass the knowledge on to others; and,
- Good linkages with the government, extension workers, researchers and Nile Breweries will ensure that the inputs acquired during the project life span will continue to be sustained.

Future plans

The project will benefit from the following undertakings:

- Converting the growers associations into a strong co-operative movement links them together with larger development partners;
- Encourage group marketing;
- Start a seed multiplication scheme for quality sustainability; and,
- Encourage farmers to re-invest the money from the *Epuripur* into other projects such as poultry or piggery.

Discussion and response from participants

AP member Eng Kaima commenced the participant's responses with a comment on the low participation from the local district government that he had observed while visiting the project area. He was keen to hear what the implementers were doing to address this issue.

Elizabeth Obanda of Africa Now lauded the visible increment in household incomes manifested in the purchase of various items such as bicycles. However, she wondered whether this increment had been measured. MATF's Joseph Kinyanjui was curious about the differences between the local sorghum variety and the improved *Epuripur* sorghum. He was also concerned about the labour intensive aspect of growing the crop and whether the income was worth all the "back-breaking" work.

The project presenter started his response by informing the participants that 90% of the sorghum was being sold while 10% was kept for planting and subsistence. "This is an indication of the high commercialisation the crop has managed to attain as a result of the project," he explained. The presenter also clarified the issue of local government participation by informing participants that authorities in Pallisa district had been "studying and trying to interpret the project into their own plans."

On the question of what differences there was between the local and *Epuripur* sorghum varieties, the presenter explained that the local sorghum could produce 200 kilos from an acre. With the project intervention, and if well looked after, an acre can yield up to 700 kilos of sorghum. In terms of physical appearance, the local variety was small with brown seeds, while the *Epuripur* sorghum was white with big seeds. He added that the demand from Nile Breweries was 4000 tonnes per season. "The project farmers managed to produce 135 tonnes. However, other districts are also growing *Epuripur* sorghum but they have not yet reached the level of Pallisa district," he explained.

On the issue of whether growing the crop was worth it for the farmers, "The input costs, which included labour, were estimated at approximately Ushs 91,000 to yield a sack of sorghum. A farmer obtains Ushs 150,000 per sack from Nile Breweries," the presenter informed the participants.

AP member Joseph Oryokott wrapped up the discussion with an observation that "*Epuripur* sorghum is a good illustrations of what market linkages can do." He informed participants that it was released as a new variety in 1985, but it's only in the year 2000 that Nile Breweries modified its production line to start using the crop.

Presentation

By Paul Stewart

Technoserve Tanzania

Crop Production Technologies

Business solutions for the Tanzania coffee industry

Project rationale

90% of Tanzania's *Arabica* crop is produced by 400,000 small-scale growers on plots of 1 hectare using 'back-yard' processing techniques that result in a low quality product. Most producers sell their crop to traders or co-operatives that do not provide incentives for quality. Lack of quality incentives and non-existent extension services has resulted in low farm productivity.

Improving half of Tanzania's coffee to speciality-grade, coupled with a modest increase in farm productivity, would benefit 200,000 rural families and increase foreign currency earnings annually by US\$30 million. Technoserve collaborated with KILICAFE to introduce Central Pulperies Units (CPUs) which would increase the quality and value of the farmers' product through using refined techniques and new equipment.



Targeted coffee growing areas.

Key objectives

The project set out to improve the quality of the coffee by installing ten CPUs to an equal number of farmer business groups in the southern highlands of Tanzania.

“Technoserve collaborated with KILICAFE to introduce Central Pulperies Units (CPUs) which would increase the quality and value of the farmers' product through using refined techniques and new equipment.”



Methodologies used

- Installation of new CPUs (site selection and design, business plans, capital acquisition, construction oversight, staff training).
- Partnering with KILICAFE to develop a new central pulperies business model. KILICAFE provides credit, bulking of saleable volumes and strict financial management that pays farmer groups the true value of their coffee.
- Training on CPU business management knowledge and skills.
- Improve access to loans and markets for the CPU businesses that were enabled.

Presentation

By Paul Stewart
Technoserve Tanzania

Speciality Coffee

Achievements

Ten CPUs were successfully installed which has led to:

- Enhanced income opportunities for many smallholder coffee farmers. The impact on farmer incomes will be measured in quarter eight of the project;
- Creation of 104 new jobs at the new CPUs;
- 102 CPU staff trained in the effective operation of a CPU as a business;
- 20 technical staff (two from each CPU) trained on technical aspects of CPU operations and maintenance;
- 228.4 metric tonnes of coffee were processed at the CPUs. Sales will be verified after full sales reconciliation in quarter eight; and,
- US\$53,577.22 capital loans from the MATF project were distributed to CPU businesses. Additional loans were distributed to the groups by KILICAFE.



Coffee cherries undergoing processing with a central pulper unit using the very latest technology. The units have enabled small-scale farmers to be owners of highly successful 'speciality coffee' businesses.

Discussion and response from participants

AP member David Hopkins, starting off the responses, was keen to establish from the presenter whether the speciality coffee sold by KILICAFE was being blended with other varieties after export or being sold as single origin. He was also concerned about the issue of replication and "whether in fact a similar project could be initiated in Kenya, for example."

There was a query regarding the shelf price of the speciality coffee once it got to London or New York, and how this compared with the price the farmers were receiving in Tanzania. In addition, participants were curious about marketing information provided to KILICAFE concerning the international market linkages and whether this could be sustained after the exit of Technoserve from the project.

The presenter informed participants that 17% of the KILICAFE coffee exported the previous year was single-origin, while the rest was blended coffee. "Consumers are keen to know where the coffee was coming from and this had encouraged exporting countries to provide unblended coffee. Most shops in the western markets display packages branded as Kenya coffee, Ethiopian coffee or Tanzania coffee," he explained.

On the issue of replication, the presenter mentioned that the project in Tanzania was timely and that lots of enquiries had come from across the region regarding similar initiatives. He was hopeful that similar projects would be replicated in Kenya and other East African countries, even Rwanda. On pricing issues, the presenter agreed that prices varied greatly from the farmer price to the prices found in coffee shops in the west. This was due to increased overhead costs, such as rent and labour; in those countries. Finally, the presenter explained that market linkages established from the project would be sustained through KILICAFE, who now have a business relationship with the various buyers of the speciality coffee.

Presentation

Discussants:

Helen Nyagori

Tanzania Gatsby Trust

Constantine Kandie

Kenya Gatsby Trust

Mrs Ndema Mbise

AP Member, Tanzania

Emerging Issues

Effectiveness in micro-finance/credit for smallholder agriculturalists

The following issues have arisen on the micro-finance and credit components of the various projects presented at the workshop .

Micro-credit operations

Micro-credit features as a minor aspect of the overall project implementation. Most projects reported that they were unable to provide credit. Most also gave short reports regarding the credit performance. A few indicated that the credit operations performed well and the indicators were in the form of repayment rates. One project reported a repayment rate of 75% and another reported a rate between 64% and 100%. These rates were presented as being successful performance indicators of the project's micro-credit components!

Nevertheless, operating a micro-credit is a project in itself. It requires a good plan in order to perform well. The projects that recorded poor performances in their micro-credit components did not give reasons why these failed.

Best practices and emerging issues

Micro-finance operations are required to follow some guidelines based on best practices for good performance to be achieved. Every project with a micro-credit component needs to adopt these practices into their operations.

It was noted that the credit models in most of the projects were not clearly articulated. Some of the projects did not have credit operating manuals while others did not have credit partners in the partnership mix.

Sustainability of credit was not factored in the project design. There was no clear criteria for giving credit and apparently, every project assumed that every farmer was credit-worthy. This does not conform with best practices of micro-credit operations.

The issue of interest rates was also not clearly addressed. Was there a consideration to operate along market rates? How were they finally set in the projects? Regarding the credit model, was there security for the credit?

In terms of group loans advanced to the farmers, were these well articulated? For individual loans, did they have assets that could be used as collateral? On the issue of credit periods, were these addressed in regards to harvesting or production seasons?

On the question of performance and its measures, what were the benchmarks used by the projects? For example, in a situation of 64% which was regarded by project implementers as a good measure, best practices require a repayment of 95% and above.

Since the projects were agricultural based, it follows that their micro-credit aspects were offering credit to agriculture. According to best practices of credit operations, this is regarded as a risky business. In case of a natural disaster affecting this sector, there would be no harvests or production and therefore no payment. Did the projects have an alternative repayment plan for such an occurrence?

Did the projects have tailor-made products for the businesses at hand and their type of borrowers? Where the project managers doubled as credit managers, how effective was the loan follow-up in the micro-credit operations of the project?

“Micro-finance operations are required to follow some guidelines based on best practices for good performance to be achieved. Every project with a micro-credit component needs to adopt these practices into their operations..”

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Tanzania Gatsby Trust

Constantine Kandie

Kenya Gatsby Trust

Mrs Ndema Mbise

AP Member, Tanzania

Micro- finance and Credit

There was clear lack of articulation when it came to indicating what the credit was going to be used for. Was it for the purchase of inputs such as equipment or paying for labour? When dealing with risky businesses, the projects did not clearly show other alternative sources of income.

When providing group loans, did the projects examine whether the groups were cohesive enough? Some of the projects were near urban areas where cohesion is loose. On the question of gender, most projects were comprised of women who were generally better payers than the men. However, it was noted that average payments were still low for most of the projects which had a micro-credit component. Did the projects consider the poverty levels of their borrowers? If the clients were the very poor, they were likely to default because of addressing their immediate basic needs rather than the project objectives.

Finally, it was observed that political influence hindered efficient operations of the micro-credit components. Political bodies got involved in some of the projects and their micro-credit aspects. Most beneficiaries started looking at the credit as a grant and they therefore defaulted on repayments.

Discussion and response from participants

The FARM-Africa Kenya Country Director, Helen Altshul, commenced the discussions. She clarified that from the point of view of the MATF management, most of the issues raised had been covered during the MATF evaluation. The question of providing credit to the grantees had been examined at length. "One of the things that came up which was relevant, was the attempt to reach the poorest of the poor," she explained. "It's important to realise that the issue has been raised now and again in similar discussions, and that it's good for projects to examine the profile of their borrowers due to instances of low repayment rates," she concluded.

AP member Mrs Mbise requested K-REP to share on their micro-leasing experiences. She explained that this would be useful in clarifying the workings of the system and how it was superior to micro-lending. "Other aspects participants needed to examine were on the lack of linkages between the micro-credit components of the projects, and professional institutions such as Pride and other micro-finance banks," she added.

Other issues that needed scrutiny were on group dynamics and guarantees. These were good for ensuring members pay back their loans, but unfortunately, their sustainability was in question following the end of the MATF funding. Mrs Mbise explained that, "Their direction is uncertain, and we do not know what is going to happen to them. This needs to be addressed during this proceedings."

The K-REP experience on micro-leasing was shared by Augustine Cheruyiot. He informed participants that the K-REP initiative aimed at providing equipment to the beekeeping project beneficiaries rather than cash. This had ensured that the farmers acquired assets rather than money which could be diverted to addressing other basic needs in their households.

The micro-leasing component required the beneficiaries to register with K-REP bank and give an 8% deposit for the purchase of the equipment, through an FSA. Upon registration, the FSA identifies a supplier and then makes a request for the loans. K-REP subsequently writes an LPO to the suppliers of the beekeeping equipment such as Honey Care Limited or African Beekeepers Limited, who also buy the honey from the farmers.

K-REP encourages the FSAs to work closely with the suppliers to ensure that farmers are trained on how to use the equipment once it is delivered. The repayments to K-REP commence once they start harvesting and delivering their honey. "In this way, K-REP has ensured that poor farmers are able to own equipment that can continue to generate income even after the project period," he concluded.

Presentation

Discussants:

Helen Nyagori

Tanzania Gatsby Trust

Constantine Kandie

Kenya Gatsby Trust

Mrs Ndema Mbise

AP Member, Tanzania

Micro- finance and Credit

There was a comment from Michael Mbaka of Family Concern, who noted the relationship between project's income generation and repayment rates. He observed that most projects did not generate the incomes hence repayment was hampered. Some technologies had long term benefits which needed to be factored into the micro-credit components. Issues of how soon payments were expected to commence should have been considered while looking at the period expected for the project benefits to be realised.

Dr Regina Karega of Kenyatta University commented on the issue of the poor of the poor; and micro-credit facilities. She was of the opinion that what they required mostly was food on the table and not credit. "Assessments in communities had shown that these members of society did not own assets such as land. In most cases, they are looking for employment from the homes of people who were a better off than they were," she explained. She suggested that it was better to give credit to the people who were better off, and who owned some land. They would in turn generate income that would trickle down to the poor of the poor through employment. She emphasised the importance of projects linking up with partners whose core business was micro-finance such as K-REP or the Kenya Womens Finance Trust (KWFT). This would ensure proper adherence to best practices in micro-credit operations.

Helen Altshul clarified on the issue of repayment periods within the MATF funding model as regards the micro-credit components. She said that the MATF looked at the project proposal in terms of sustainability. "There are no requirements for micro-credit aspects, or repayments that should be done within two years. If the proposal contains a micro-credit scheme, the question of who operates it arises. MATF would like to see whether the project will have partnership linkages with a micro-finance institute that will continue operations beyond the project period," she explained.

AP member Prof Agnes Mwang'ombe informed participants about revolving funds and the MATF experience on the question of addressing the concerns of the poor of the poor: "The challenge for MATF has been on how to make these funds work to first put food on the table, before addressing the other project objectives," she said.

Africa Now shared its own experiences on micro-finance. Elizabeth Obanda informed participants that the organisation had managed to incorporate best practices outlined earlier into micro-credit aspects of the projects. This was through proper guidelines for the farmers, valuable partnership with micro-finance institutions and FSAs in Kakamega and Vihiga. Fixed interest rates and fixed repayment periods were also adhered to. She observed that problems of defaulting arise due to a lack of proper and close follow up on the borrowers.

Other comments from participants emphasised on the need to look at micro-credit as a business. Participants cited village banks as good guarantors in the micro-credit components because the projects could fall back on the savings incase of defaults. ARI-Tumbi shared its experience while implementing their project on processing wild fruits. The co-ordinator, Jonathan Chilligati, informed participants that the project utilised a partner with experience of managing revolving funds and micro-credit. These were the district community development officers, who supervised the participating farmer groups.

On the way forward, the discussants recommended initiatives that build on aspects that worked. This could be on relationships with micro-credit institutions. Other proposals were to encourage projects to work with more organised groups. Projects were asked to continue with the requirement of commitment fees from their members. This was observed to ensure greater responsibility and commitment to the project from its beneficiaries.

Poor record keeping was seen to have hampered the recovery of funds in most of the projects. This should be improved upon through more training. The discussants also recommended training in group dynamics to strengthen them, which will help in loan management and repayment. On giving loans to the poor of the poor, it was recommended that this should be minimised due to the high probability of default.

Field Trip

Workshop participants visit two MATF projects.

Feedback and discussion

A visit to the oyster mushroom cultivation and tissue culture banana projects.

Workshop participants took time off to visit two MATF projects focusing on innovative crop production in northern Tanzania. The oyster mushroom cultivation technology is an ongoing round 4 project located in Hai district, Kilimanjaro region. The Horticultural Research Institute Tengeru (Horti-tengeru) has been promoting the technology since mid 2005 with the aim of improving nutrition, food security and poverty alleviation. One group of workshop participants visited the Kihaki, Nshara and Kisau mushroom groups.

The other group visited the Mbuguni and Polindatu groups in Arusha region, where the tissue culture banana project is being implemented. This is a regional Round two project located in Mbuguni, Arusha region of Tanzania and the Kisii highlands of Kenya. ISAAA, an international NGO in the field of bio-technology applications, has been promoting the technology since February 2003. The project has been promoting the fast-growing and disease-resistant tissue culture banana varieties. It was granted a one-year extension in 2005 to consolidate the gains made during the two-year funding period.



workshop participants view substrates or crop residues (banana leaves and rice husks) used in the cultivation of oyster mushrooms. The residues are steamed and dried to provide a sanitised environment for mushroom spores to grow.



1. Horti-Tengeru's project co-ordinator Nancy Kaaya displays a bottle of mushroom spores.
2. A farmer mixes sanitised crop residues with mushroom spore inside a polythene bag.
3. Mature oyster mushrooms sprouting from polythene bags in a shed run by the Kihaki group.
4. Robert Mchau, the Kihaki mushroom group chairman displays harvested mushroom.
5. Dried and pickled oyster mushroom varieties, ready for the market.



1. Workshop participants arrive at the tissue culture banana plantation in Mbuguni village, Arusha.
2-3. Participants view healthy growing tissue culture bananas.
4. Ripe bananas in a micro-ripening chamber. Harvested green bananas are first dried in the sun and afterwards placed in a small wooden chamber. They are then covered with banana leaves. The resulting warm environment hastens the ripening process.

Field Trip

Workshop participants visit two MATF projects.

Feedback and Discussion

The visit to the oyster mushroom growers of Hai district provided an excellent opportunity for workshop participants not only to learn about the relatively easier farming of mushrooms, but also to sample the delicacies of the food crop.

Feedback from the participants

The field trips provided the workshop participants an opportunity to learn first-hand about the two crop production technologies funded by MATF. They had set out in two groups, each visiting a different project. On their return, the visiting groups made their presentations and comments regarding the projects.

The tissue culture banana project in Mbuguni and Polindatu villages has shown remarkable growth over the years. From humble beginnings where participating farmers had started off with 80 plants in one group, the workshop visitors were informed that some members are already growing up to 300 plants.

Participating farmers also received training in a number of areas including business management skills, group formation and record keeping. They also took part in educational trips organised for them by the project co-ordinators.

The project has had a positive impact in the livelihoods of the beneficiaries. There is an improvement in household nutrition from readily available bananas for domestic consumption. Income generated from the sale of the bananas has provided money to buy other foodstuff, household assets and pay school fees.

Project visitors were informed of various challenges facing the farmers. They learnt that water shortage remains a major constraint in the uptake of the technology by widows and single mothers. Farmers with no livestock had to buy manure for their farms and this was discouraging to potential beneficiaries of the technology. Small land sizes prohibited expansion of the technology in most of the farms.

Despite these hurdles, the participating farmers in Mbuguni have been able to form a committee to market their produce. They've been able to sell their bananas between TShs 3500-4000 in the market. The committee has also introduced value addition to the produce through ripening. This has been achieved with the use of micro-ripening chambers. Ripe bananas fetch better prices than the raw varieties at TShs 7000-7500.

The visit to the oyster mushroom growers of Hai district provided an excellent opportunity for workshop participants not only to learn about the relatively easier farming of mushrooms, but also to sample the delicacies of the food crop. The visitors saw the enthusiasm in which the technology had been taken up by farmers in Machame north, south and central wards of the district since mid 2005.

The adoption did not come easy though. Horti-tengeru, the project implementers, initially had to tackle negative perceptions of the crop among the majority inhabitants of the district, the *Chagga* people. They believed the crop was poisonous and therefore unfit for consumption. It took demonstrations through cooking and tasting by the project co-ordinators to convince the farmers to take up the practice.

Through their own existing welfare groups, the farmers were able to build their own sheds and grow the mushrooms. Horti-tengeru provided them with growing seed (spores) and training on how to grow, cook and market the crop. They also provided solar driers which the groups used to produce the durable dried varieties.

The workshop visitors heard from various group members about the benefits they had derived from the technology. Many cited better household nutrition from the mushrooms, which they had learnt were a rich protein source. In addition, the technology was easier to adopt because it required little capital, space and labour. Besides, crop residues which are the growing base for the mushrooms, were readily available at the farms.

One year after the start of the project, the groups have been able to sell the crop in their local informal markets. They have also managed to sell in urban markets through outlets such as *Shoprite*, the leading supermarket in Arusha, and hotels in Moshi. The farmers were selling a kilo of fresh mushrooms at TShs 15000. The project has great potential to generate good incomes for farmers through expansion into new markets.

Presentation

By Prof Agnes Mwang'ombe

AP Member, Kenya

Eng Kaima Meya

AP Member, Uganda

Emerging Issues

Sustainability and exit strategies: MATF initiated projects

Current status of the projects

Selected and ongoing projects have incorporated sustainability and exit strategies. This is positive. However, most projects start to implement these at the seventh or eighth quarter of the project life. Due to this late implementation, they are least prepared to fully devolve the projects or activities to the beneficiaries and local structures.

Recommendations

Technology

Proximity and accessibility to the beneficiaries should be enhanced. Examples where this was enhanced can be seen with the tissue culture bananas (Tanzania) and beekeeping technologies.

Group formation

Should be done bearing in mind the cohesiveness, size and number of groups with respect to quantity of the resultant products. Group foundation will also vary across different countries. For example, it has been observed that groups in Kenya have developed over a longer time in comparison to Tanzania.

Partnerships

Commitment from government extension service wanes after implementers have moved out. Participation or presence is evident during project life with little indication that this will continue after the project ends. Thus, such participation is based purely on facilitation with no evidence of commitment thereafter. Partners should ensure the government extension role continues even after the end of the project.

Roles

Sometimes these may overlap despite earlier corrections during project verification and follow up on proposal re-submissions. Clarity of roles is very important.

Value addition and marketing

Marketing is the driving force to production. It is a slow process and when brought in very late in the project life, it is poorly or inadequately handled. In fact, in most cases, it is characterised by visits and discussions with beneficiaries on possible market outlets with no concrete or tangible outcomes. Thus, there is a great need for proper market information on local and external markets, product specifications, packaging, market prices, handling, bulking and factoring.

Micro-credit and revolving funds

It is recommended that beneficiaries should contribute a certain percentage of the funds. A saving culture should be established through micro-credit or village bank service providers. MATF funds (as per project) can be distributed in loan form to beneficiaries as matching funds. A number of questions need to be addressed: Who owns the repaid loans, which originally emanated from MATF grant? Is it the micro-credit service providers, the project beneficiaries or the lead-implementing agency?

For MATF

Technical quarterly reports must clearly indicate that activities executed are in line with sustainability and exit strategies. For example, baseline data on market information for a specific product. This is a process which should start early.

“Commitment from government extension service wanes after implementers have moved out. Participation or presence is evident during project life with little indication that this will continue after the project ends.”

Presentation

By Prof Agnes Mwang'ombe

AP Member, Kenya

Eng Kaima Meya

AP Member, Uganda

Discussion and response from participants

AP member Joseph Wekunda, commenced the participants' comments with a response to the question of micro-credit and revolving funds. He explained that the funds were meant for farmers, to help them continue with project activities. He cited the example of the mushroom project where farmers had started a revolving fund. He asked that this should be strengthened for their benefit.

The MATF fund manager Dr Lydia Kimenye, commenting on the same issue explained that at inception, every project had a micro-credit component in it. "There was a desire that the seed money going into the project and developed into revolving funds would eventually go into the community," she added.

MATF believed that the money would be passed to the farmer groups or SACCOS by the institutions managing the funds at the end of the two-year project period. The fund manager clarified further, "It was thought that the groups would have the capacity to manage the revolving funds. Unfortunately, this did not take place in most of the projects. The actual process of handing over was not well thought out and this needs to be done," she concluded.

Elizabeth Obanda, sharing on the experience of Africa Now, explained that they had taken the approach that the money was meant for the communities. They were however not confident that the community could run the revolving funds. "We opened an account at the village bank with four signatories, two from Africa Now and two farmer representatives." She explained that withdrawals could only be done by representatives from both parties. "One party could not withdraw on its own, and this ensured the money was not misused," she added.

AP member Joseph Oryokott, commented that, "Part of the project's responsibility should be to develop farmer groups into bigger entities such as SACCOS. Such an entity will be able to manage the micro-finance aspects of the farmer groups," he explained. Prof Sarwatt, AP member, noted that, "At times groups do not utilise equipment provided by the project. Such equipment if not fully utilised by certain groups, should be given to the more active groups." He informed participants that a revolving fund was not only money, but also equipment, and these should be utilised.

Speaking on the issue of sustainability, AP member David Hopkins recommended that information on clear financial benefits for the communities should be provided within the projects. "We should sit and develop appropriate business plans identifying costs and establishing targets for the community. This can be incorporated into the projects, giving the communities an indication of what needs to be done, whether increasing production or pricing in order to achieve a profit."

Dr Lydia Kimenye informed workshop participants that most projects while scaling out, were thinking of sustainability within the structures they had in place and passing their activities to the farmer groups they had helped form. She recommended the inclusion of the private sector in sustainability and exit strategies. This could be done through value addition. Asking participants to consider the issue, she remarked, "Would it be better for farmers to make wines and juices from their bananas, or to let a private entrepreneur invest in the business once the production warrants it? If it's the beekeeping projects, should we let the farmers do the packaging of the honey themselves?"

The fund manager emphasised the importance of looking at the whole value chain and seeing where opportunities lay for the private sector to come in and invest. "We should think of how to bring in the private sector to do what they are best suited to do as way of exiting the projects. There should be no fear of farmers being exploited. If the strategy is done well, farmers will be able to come out of poverty," she concluded.

Closing the discussion, MATF's Chris Webo called for projects to "move beyond food security to business in a participatory way. That way, the technologies will be sustained."

Presentation

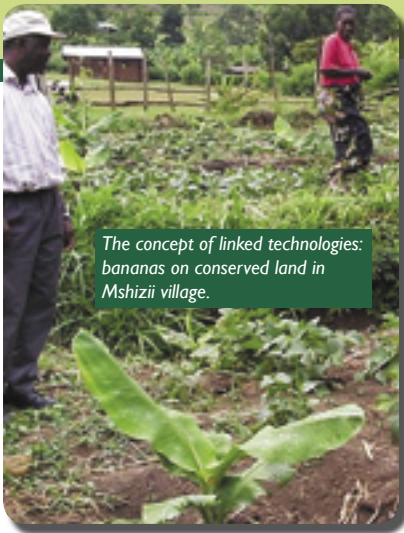
By Juma Wickama
SARI, Tanzania

Integrated Natural Resources Management

Reaching more farmers, more quickly: scaling out integrated natural resources management technologies in the north-eastern highlands of Tanzania

Lessons and experiences from project implementation in Lushoto

“The project aims to enable more farmers in five villages in Lushoto, Boheloi, Lwandai, Mbuzii, Mshizii and Ubiri, to access and benefit from four linked technologies.”



The concept of linked technologies: bananas on conserved land in Mshizii village.

Project rationale

Natural resources are declining in the west Usambara highlands, Lushoto, Tanzania, leading to smaller agricultural yields. This has led to decreasing household income and falling food security. The project aims to enable more farmers in five villages in Lushoto, Boheloi, Lwandai, Mbuzii, Mshizii and Ubiri, to access and benefit from four linked technologies. These are: improved bananas, soil conservation measures, soil fertility improvement and tomatoes, which were piloted earlier in Kwalei in Lushoto.

Key objectives

Broadly, this project aimed to contribute towards the improvement of livelihoods of the farming communities in Lushoto district. More specifically, the project aimed to address the following key objectives:

- Build capacity of 20% of farmers in the target villages to test and adopt improved varieties of tomatoes, bananas, soil and water conservation technologies;
- Enable 30% of farmers in the target villages to access markets and better marketing opportunities for their produce;
- Identify three major factors which promote effective partnerships in technology dissemination; and,
- Validate the effectiveness of four dissemination methods (farmer exchanges, technology demonstrations, easy-to-read leaflets and posters, and local traditional dances).

Partners and their roles

Key partners and their respective responsibilities were:

- SARI - Coordination of the project and advice on crop-based technologies;
- ARI-Mlingano - Advice on soil management;
- Tanzania Forestry Research Institute (TAFORI) - Technical support in tree based technologies in the project villages;
- Traditional Irrigation and Environmental Development Organisation (TIP) and the Soil Erosion Control and Agro-forestry Project (SECAP) - Training in soil conservation technologies; and,
- District Agricultural and Livestock Development Office (DALDO) Lushoto - follow-up of project activities in the target villages.

Methodologies used

To increase awareness about the project technologies, the following methods were used:

- Rapport building meetings with village and district leaders, partner institutions, project implementers and target communities;
- Collection of baseline data using quantitative and qualitative methods;
- Capacity building programmes through formal classrooms, exchange visits, market surveys, field exercises and demonstration plots (bananas, tomatoes and cabbages);
- Promotion of the project technologies through leaflets, demonstration plots, farmer tours and field visits;
- Research into the effectiveness of the dissemination methods; and,
- M&E through quarterly reviews among project implementers.

Presentation

By Juma Wickama

SARI, Tanzania

“The funding period of two years is too short for some technologies such as banana and soil conservation structures. These technologies need an extra year if they are to be disseminated effectively.”

Achievements

The project met its intended objectives with respect to soil fertility improvement, tomatoes and cabbages. Other achievements were as follows:

- 20% of households (580) in the target communities have adapted the introduced technologies to their local conditions;
- 50% of the intended households adopted soil conservation structures. 23,404 meters of structures were implemented in the project villages;
- 30% of target farmers have access to reliable markets for their tomatoes and cabbage produce. Practically all project farmers now use mobile phones to reach traders in Dar es Salaam before delivering their products;
- More farmers now sort their produce before delivering and are applying better packaging technologies offered by this project;
- The most effective method for scaling up of resource management at watershed level is in the order of: demonstration plots; farm exchange visits; market visits; drama; leaflets; and,
- The livelihoods of the farmers in the five villages have improved through participation in the project.



Farmers looking on as their tomatoes are packaged for the Dar es Salaam market.

Lessons learnt

The following lessons were learnt in the course of the project:

- Bananas, though preferred, were slow to multiply compared to vegetables. Further monitoring on their ultimate performance is required;
- The funding period of two years is too short for some technologies such as banana and soil conservation structures. These technologies need an extra year if they are to be disseminated effectively;
- Rapport building is essential for the good start of any project and resources should be spent to interact with the communities;
- Conduction of household surveys at project inception provides the project team with a picture of potential opportunities and obstacles awaiting the project;
- Farmers tend to believe that certain technologies work when they hear that their fellow farmers are practising them, rather than listening to technical staff;
- We have learnt that training of para-professionals for measuring the soil and water conservation structures is both an effective, economical and a sustainable way of empowering the affected communities to establish conservation structures by themselves;
- If well conducted, demonstration plots is one of the strongest dissemination technique for convincing farmers that a technology works;
- Market surveys that show availability of markets and that produce can be sold profitably, builds the interests of farmers to venture into production of goods;
- Training of farmers in business skills allows them to develop a business attitude in their production activities;

Presentation

By Juma Wickama
SARI, Tanzania

Integrated Natural Resources Management

- Many farmers need education on how to form SACCOS and other micro-finance schemes because they are the easiest forum through which farmers can acquire credit;
- Field days are essential to strengthen the motivation for adopting technologies as farmers can share and interact with researchers, extension staff and policy makers;
- Awarding prizes to excelling farmers leads to a sense of competition among non-adopting farmers;
- Farmers participating in the project must meet some criteria and conditions after the completion of the project; and,
- For post-harvest technologies, women seem to prefer the value addition technologies such as the jam and pickle making, while men seem to prefer the packaging technologies.

Challenges faced

The project faced the following challenges:

- Reduction in the number of para-professionals taking part in the training as 20 left due to relocation;
- Farmers' lack of knowledge on forming and running of micro-finance schemes; and,
- Political support is required for the establishment of terraces as they are very labour intensive. This would be in terms of mobilisation.

Discussion and response from participants

Prof Mwang'ombe, AP member, started the participants' responses with an observation that the terracing component of the project was labour intensive. She noted that farmers in Kenya had been able to innovate and make terracing easier by using napier grass. She explained that, "These are planted by farmers along the contours. On cultivation, they end up with natural embankments that control soil erosion very well." She recommended that this should be adopted in areas with labour challenges. The AP member also requested further clarification on the issue of banana suckers. She was keen to know what steps the project implementers had taken in ensuring nematodes and other diseases were not transmitted during distribution.

There was a query from Michael Mbaka of Family Concern on the para-professionals in the project and whether they were being paid. On another issue, Salome Wamuyu of ISAAA Tanzania, suggested the inclusion of a private entrepreneur to supply clean planting material for the bananas. The entrepreneur could establish a gardening nursery to do this and ensure the plantlets were disease-free. "Even if the initial plantlets were free from infections, it does not mean that the mother trials would always remain clean," she explained.

AP member Joseph Wekunda, was impressed by the impact the project had registered. However, he was keen to establish whether any project benchmarks had been established by the co-ordinators.

The presenter commenced his responses by providing some background information pertaining to the project. He informed the workshop participants about the linkages established with regional crop experts such as Dr Ally Mbwana of Tanzania. Through such linkages, the project implementers had learnt a lot about crops such as bananas.

On the issue of cover crops, the presenter said that some areas did not use these crops although napier grass had been grown in Lushoto, to make terraces. Other farmers had used stone terraces rather than cover crops. Responding to the benchmarks query, he clarified that the project focused on the profile of farmers adopting the technology. "Although not clearly indicated in the presentation, the project's main concern was to see adoption of the linked technologies that were promoted," he explained. On para-professionals and their pay, he explained that initially, they were highly motivated and worked for free, but later, farmers started showing their appreciation by offering them some compensation.

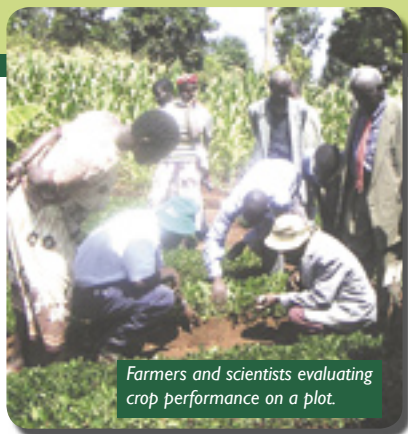
Presentation

By Dr Regina Karega
Kenyatta University, Kenya

Integrated Natural Resources Management

Participatory scaling-up of soil nutrient management technologies for increased crop yields in smallholder farms of central highlands of Kenya

“The innovative technologies used included biomass transfer (*Tithonia diversifolia*, *Calliandra calothyrsus*, and *Leucaena trichadra*) and farm manure either as a sole application or when combined with half the recommended rate of inorganic fertilizer.”



Farmers and scientists evaluating crop performance on a plot.

Project rationale

The goal of the project was to scale-up the most promising soil replenishment technologies for smallholder cropping systems in order to increase yields and food security in Meru south district of the Kenyan central highlands at four sites: Kirege; Mucwa; Mukuuni; and Murugi sub-locations.

Key objectives

The project had the following objectives:

- Scale-up the most promising nutrient management technologies;
- Train farmers in the use of the new technologies; and,
- Develop training and dissemination materials.

Partners

The following partners contributed to the implementation of the project:

- Kenya Agricultural Research Institute (KARI-Embu);
- Kenya Forestry Research Institute (KEFRI); and,
- Tropical Soil Biology and Fertility Institute of CIAT (TSBF-CIAT).

Methodologies used

- The innovative technologies used included biomass transfer (*Tithonia diversifolia*, *Calliandra calothyrsus*, and *Leucaena trichadra*) and farm manure either as a sole application or when combined with half the recommended rate of inorganic fertilizer.
- Participatory Rural Appraisal (PRA) was conducted to establish the needs of the farmers in relation to soil fertility and identify the solutions to these problems.
- Demonstration sites were established with farmers then choosing which technology to implement at their farms.
- “Farmers training grounds” were established where farmers practiced some of the technologies.
- Village training workshops were held which attracted the youth and women who were unable to travel due to economic or household relations issues.

Achievements

A number of major achievements were accomplished in the last two years including:

- Four PRAs were held; 1428 farmers for problem diagnosis, and 2118 farmers in prioritising solutions;
- Three additional demonstration sites were established in Meru south district in Mucwa, Murugi and Mukuuni sub-locations, in addition to the original Kirege site;
- Maize crop produced by the trained farmers was distinctively better than other farms and the control plots at the demonstration sites;
- About 1750 farmers were trying the technologies on their farms in the project area;
- Four pamphlets and two posters developed and printed, with a total of 8000 pamphlets and 3000 posters distributed;
- An extension training manual was developed and is currently being printed;
- 16 village training workshops have been held; four at every site with a total of 1,977 farmers participating;
- Four farmer field days were held in the various demonstration sites with 1,761

Presentation

By Dr Regina Karega
Kenyatta University, Kenya

Soil Nutrient Management Technologies



Above: an extension officer demonstrates to farmers how to manage manure on a farmers plot. Right: a farmer demonstrates how he incorporates biomass in the soil.

farmers participating;

- Eight tree nursery training workshops were held with 37 nursery groups being trained on nursery establishment and management;
- The farmers are also establishing other types of seedlings at their group nurseries. Most of the groups have also been registered as CBO's with the Ministry of Cultural Services;
- Farmers outside the project area have indicated interest to form nursery groups;
- Most farmers in the nursery groups have planted calliandra and leucaena trees at their farms and some have reached the target of 500 trees for feeding one cow for a year; and,
- One extension staff training workshop was held with a total of 59 extension staff trained on the different soil fertility technologies.

Challenges

The main challenges, and the proposed solutions, are as follows:

- The rainfall during the two seasons was very low leading to a poor performance of the technologies which made it difficult for the farmers to determine which was the best technology to adopt. Farmers were encouraged to use organic manures to assist in moisture conservation;
- Groups had difficulty keeping records and they are now establishing a new recording format; and,
- The project found it difficult to interfere with failing groups so they are now being encouraged to visit successful groups to determine how they are managing their groups.

Key lessons learnt

The main lessons learnt were:

- Farmers are aware of their circumstances in terms of cash, land and labour availability and they seek advice with regard to these circumstances;
- The project has enabled farmers to form collaborative relationships with Ministry staff, Department of Forestry and retired agricultural officers. The participatory approach helped cement these linkages;
- "Farmers training ground" approach has a greater impact than demonstration plots for training farmers in the new technology; and,
- Keeping a vibrant and an effective working partnership is very challenging and more expensive than had been anticipated. Constant meetings and regular field team visits must be put in place.

Sustainability

- Farmer-led CBOs and the local authorities have been instrumental in encouraging farmers to learn from the project;
- Farmers provide their own inputs to ensure ownership of the technology;
- Organic inputs are locally available which reduces the cost of producing the technology;
- The introduced tree species (calliandra and leucaena) will provide improved fodder; which will supplement commercial dairy meal enabling farmers to save money. Research has revealed that three kilos of fresh calliandra biomass can replace a kilo of commercial dairy meal with no milk production or quality decline.

Presentation

By Dr Regina Karega
Kenyatta University, Kenya

Soil Nutrient Management Technologies

- The use of the organic resources in the technologies will improve soil fertility (especially soil organic matter).
- The use of tree species planted along the contours will lead to reduction in soil erosion and, in addition, the deep roots will intercept the leached nutrients thereby reducing the possibility of eutrophication and ground water pollution.

Discussion and response from participants

The participants' responses commenced with a question from Samuel Njihia of KARI-Muguga. He was keen to know how the experiences of the soil management project could assist KARI's "push-pull" project, considering that they were operating in the same area of central province in Kenya.

AP member Joseph Wekunda, was interested to establish from the presenter the amount of biomass needed to meet the demand. Does each farmer have enough biomass?

MATF's Monicah Nyang' sought clarification on the issue of labour demand and its challenges in the project. In addition, there was a query on the processing of soya within the project. Is the environment conducive to support this initiative and produce soya that will meet international standards?

Joseph Wekunda commented on the issue of having a baseline survey. He said that the issue was important for the project implementers to appreciate because it provided a basis for comparing what was there before project intervention and afterwards.

The response from the presenter acknowledged the need to enhance linkages with KARI-Muguga. She said that it be useful to share experiences with the push-pull project, especially now that Kenyatta University was already linked with KARI.

On the issue of the biomass required by farmers, the presenter informed participants that, "Soil scientists had calculated that with 500 trees of *Tithonia*, you can feed your cow satisfactorily, and that improves on manure." She added that the farmer groups had created a seed bank, sharing at their own farms, with some having 1500 trees. They had advised the farmers (individually and as a group) that they need to leave 30 trees for a seed bank and sustainability. From the figures collected by the project, on average, each farmer had enough for one cow.

The presenter further explained that the farmers were now using the *Tithonia* to help in curbing soil erosion along the slopes and contours, and for dividing their plots. This additional usage also helps in increasing *Tithonia* production to meet the livestock needs of the farmers and other demands.

On the issue of labour demand, participants learnt that the project was already conducting research on the issue through students. "Some findings have shown that women prefer technologies that have wood fuel components. Men on the other hand prefer technologies that are easily marketable such as soya," she explained. "Women prefer the ones that allow them to get wood fuel because they will not have to walk long distances," she elaborated.

Workshop participants were informed that the PRA conducted by the project had indicated that men and youth in the target areas were idle for lack of jobs. The project has ensured that these groups are fully occupied on the farms because they see that their crops are able to grow. For the ones who are better off, they have been able to employ labour.

On the question of growing soya, the presenter clarified that the project was aiming to produce high quality produce. There were plans to invite the Kenya Bureau of standards and a marketing firm to work with the farmers on that issue. "The farmers are already linked to the Ministry of Agriculture for extension purposes," she added.

Presentation

By Dr Joseph Mutua
KENDAT, Kenya

Integrated Natural Resources Management

Enhancing adoption of Conservation Agriculture through local manufacture and repair of implements

“The aim of the project is to teach local artisans to make specialised equipment such as animal drawn rippers and subsoilers, which can break the hardpan without turning the soil.”



Implements used for none-inversion tillage and removal of hard pans.

Project Rationale

Most soils in Kalama division of Machakos district in Kenya, and Arumeru in Tanzania, are hard setting and prone to surface crusting. Many years of conventional tillage, where the soil is repeatedly turned over, has caused hard pans to occur which inhibits water infiltration and root development, leading to low yields. Breaking these hard pans requires specialised implements.

The aim of the project is to teach local artisans to make specialised equipment such as animal drawn rippers and subsoilers, which can break the hard pan without turning the soil. The artisans will also be taught how to repair the equipment to improve sustainability of the project.



Some of the common problems caused by intensive soil tillage. From left: hard pans; impaired root development; bare soil resulting in increased runoff and severe soil degradation; and, poor drainage resulting in studded crop growth.

Conservation Agriculture

Conservation Agriculture (CA) aims to reverse the above degradation and restore soil to its original state.

Benefits of the CA system include the following:

- Improved soil fertility and reduced weed infestation;
- Reduced labour requirements;
- Reduced soil and nutrient losses;
- Improved bio-diversity; and,
- Higher yields

Conservation agriculture is adaptable for nearly all farm sizes, soil and crop types and climatic zones. Its principles are as follows:

- Crop rotation;
- Non-inversion tillage;
- Pest management;
- Mulching;
- Cover crops; and,
- Weed management.

Project background

Initial efforts began with five individual farmers who were selected from three districts: Machakos, Laikipia and Rachuonyo. Arusha had also experimented with CA with the support of SIDA and the Regional Land Management Unit (RELMA), eventually settling on best practice. The results were very encouraging as follows:

- In Machakos farmers were able to more than double maize production on account of tillage method alone;
- Laikipia experienced minimal rains but still CA farmers were able to harvest some

Presentation

By Dr Joseph Mutua
KENDAT, Kenya

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- crop when their neighbouring farmers got nothing; and,
- Rachuonyo farmers increased their yields significantly.

There were initial challenges to the adoption of CA systems by farmers due to:

- Lack of adequate knowledge and information on the practice;
- Lack of access to CA inputs such as cover crop seeds, herbicides, pesticides, fertilizers and equipment;
- CA equipment is not readily available locally and is expensive; and
- Lack of credit facilities. Farmers find it difficult to get credit for their farm operations because they lack the collateral asked for by commercial banks.

Project objectives

The project was able to scale-up seven groups in Machakos and four groups in Arusha with group membership ranging from 25 to 100. The main objective was to train local artisans in Machakos and Arusha to make rippers and subsoilers.

Other objectives were:

- To advance CA knowledge and practice by building a critical mass of practitioners through adaptive field trials, information provision and farmer exchange visits; and,
- To enhance community and support actions for sustained CA and business interventions, and initiate long-term collaborative activities between key stakeholders.

Partnership

The following were the partners and the roles they played in the project:

1. KENDAT was the lead organization and facilitated in:
 - Identification and screening of participating groups;
 - Identification of partners;
 - Organisation of training events and materials;
 - Organisation of field days and farmer to farmer exchange visits; and,
 - Overall supervision of project focus.
2. SCAPA assisted in identification of groups and partners in Arusha and co-ordination of group activities;
3. *La Compañia de Deportes e Turismo* (CODET), played the key role of designing and implementing the micro-finance scheme through group-based lending;
4. Ministry of Agriculture assisted in group mobilisation for field days, farmer exchange visits, and strengthening of linkages with local leadership and other stakeholders at the local level;
5. KARI (Kenya) and SARI (Tanzania) provided technical support in cover crops and weed control measures in CA systems; and,
6. University of Nairobi provided support in the training of artisans.

Methodologies used

The following methodologies were used in the project dissemination:

- Popularising CA through group based on-farm learning, modelled on FFS approach;
- Field days and exchange visits were very effective forums for exchange of ideas;
- Establishing a production base for the CA equipment by artisans;
- Empowering farmers with knowledge, skills and improved access to CA inputs;
- A training course in basic workshop procedures and skills to enable participants to make a prototype subsoiler and ripper;
- A second training course to review the production process, in particular the use of jigs and fixtures;
- Provision of a set of jigs and fixtures to participants; and,
- Establishment of a revolving fund: essential in empowering farmers to acquire production inputs to maximise on CA benefits.

Achievements

The following achievements were recorded by the project:

- 286 and 120 farmers in Kenya and Tanzania were directly involved in the project respectively and have replicated CA practice on their own plots.
- 200 rippers and 200 subsoilers have been sold through the trained artisans, which have enabled 800 farmers to practice CA technology (assuming each unit is shared among four farmers).

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“Farmers have reported a significant increase in maize yields, solely attributed to the removal of hardpans. In cases where other inputs such as highbreed seeds and fertilisers or manure have been incorporated into CA, a threefold to fourfold increase in productivity has been reported.”

- The project has generated great interest in commercial farming through exchange visits and training. A total of 25 farmers, nine from Tanzania, have been trained in tree grafting and are employing their skills to expand fruit tree growing on their plots and their neighbours'. In Kenya alone, the total of grafted seedlings (mangoes, avocados and citrus) is approximately 2,500 to date;
- In Kenya, 208 members (143 women and 65 men) have gained from personal loans amounting to Ksh 1,178,991 with repayment rate standing at 75%; and,
- In Tanzania, a total of TShs 1,286,000 has been loaned to 39 group members (16 women and 23 men). In addition, equipment worth TShs 375,000 was loaned to the groups on a lease agreement.

Changes in productivity

Farmers have reported a significant increase in maize yields, solely attributed to the removal of hard pans. In cases where other inputs such as high breed seeds and fertilisers or manure have been incorporated into CA, a threefold to fourfold increase in productivity has been reported.

Impacts on livelihoods

As a result of the project, the following was the impact on household welfare:

- CA has enabled farmers to triple yields to meet family food needs and sell the surplus to raise cash for other family utilities;
- The culture of personal savings has raised prospects for investments in income generating activities; and,
- CA being less labour intensive, farmers have more time to engage in social activities.



Building local capacity for fabrication and repair of CA equipment.

Challenges and emerging issues

The main challenge centred on the provision of materials to construct the equipment because some items can only be purchased from Nairobi and Moshi. The high cost of transport to purchase the materials and the inability to buy small quantities has made the equipment uneconomical. This has resulted in artisans using scrap yard metal which is of poor quality. Another challenge is to continue promoting the equipment to farmers and maintaining links.

CA adoption is yet to reach critical mass. Government should take lead in promotion of CA through its well-established structures on the ground and also provide an enabling environment which could include subsidies and credits for acquisition of CA inputs

Administration of the revolving fund

The revolving fund needs constant attention and support to keep it in tune with changing community needs and demands (diversification). This process involves boosting the seed money, strengthening its structures and the gradual disengagement of KENDAT in its operations.

Marketing issues and linkages

Marketing is a major bottleneck in promoting commercial farming. Poor linkages to markets and a lack of market information leads to exploitation by middlemen. Attempts were made to educate farmers on marketing strategies such as group marketing approach, packaging of produce and value addition. Links have been encouraged with markets such as the Horticultural Crops Development Authority (HCDA), Kenya Agricultural Commodities Exchange (KACE) and others.

Production levels of commercial crops are yet to hit critical mass to interest full exploitation of the market chain and value addition. The groups vision is to export some of the high value crops such as improved mangoes by the year 2015. Additional support will be required in terms of quality control during the production process

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to meet export market requirements, for example by obtaining certification from EurepGAP.

Lessons learnt

The following lessons were learnt from the implementation of the project:

- Exhaustive discussions with partners should start early enough, to clearly define roles and agree on budgetary allocations.
- Exchange visits are a powerful tool for farmer learning and inspiration. Growing of horticultural crops was inspired by visiting other successful farmers in Yatta and Katangi in Machakos.
- Collaboration and linkages with other stakeholders and partners is vital in resource maximising and in accelerating technology adoption.

Sustainability and exit strategy

An intensification of CA promotional activities is recommended through existing groups and the creation of new ones through formation of FFS. An equipment hire system needs to be established to make new CA equipment available to farmers.

The current fund requires additional seed money, technical back-up and diversification to be self sustaining in the long run. Activities to support an expanded revolving fund should include additional training on fund administration and record keeping, and M&E to ensure adherence to rules and regulations. KENDAT's presence will eventually give way to a trained loans officer who will run the fund on a full time basis.

Other exit strategies include establishing linkages with similar projects such the ongoing Conservation Agriculture for Sustainable Rural Development (CA-SARD) project, for experience sharing and information exchange.

Discussion and response from participants

AP member Prof Agnes Mwang'ombe commenced the responses with a series of questions on the presentation. She cited the many crop technologies that the project had promoted and she was keen to establish from the presenter what the initial target had been. Was it the equipment or the crop technologies?

Prof Mwang'ombe also questioned the use of herbicides in the project. She was of the opinion that the equipment in conservation agriculture should help reduce the use of such products. The AP member sought more clarification on the cover crops used in the project, "because the type chosen should help lower the use of fertilizers."

Lastly, Prof Mwang'ombe sought more clarification on the issue of EurepGAP with respect to horticulture. She foresaw a clash between the project's horticultural approach and the aspects of herbicides and fertilizers.

The presenter informed the workshop participants that the initial aim of the project was to teach artisans how to make specialised equipment for use in conservation agriculture. The crop technologies were the result of farmers adopting the CA practices for better soil conservation and, eventually, better crop yields.

On the use of herbicides in the project, the presenter clarified that initial excess weed in the farms had to be controlled before the CA practices could be introduced. On the cover crops, he said that various leguminous cover crops such as *Dolichos* and *Mucuna*, were used.

Lastly, the presenter explained that EurepGAP was not part of the project implementation. It only came in on the issue of certification, especially for produce targeting export markets.

Closing Session

Marketing issues discussants:

Michael Mbaka

Family Concern, Kenya

Constantine Kandie

Kenya Gatsby Trust

Policy issues discussant:

Charles Marwa

Policy and Research Officer,

FARM-Africa, Kenya

“Farmers and other project participants require access to market information. Market access involves identifying the market channel in which to participate competitively, profitably and sustainably.”

Emerging Marketing And Policy Issues

Farming as a business: Market access project considerations

The following issues need to be considered in establishing farming as a business:

- Value chain analysis;
- Strategic business plan development;
- Production capacity and product development;
- Market access and development; and,
- Financing of business operations.

Why value chain analysis?

This helps in the identification and analysis of market opportunity. The initial steps involve identifying the target product, target market, value chain players and services offered. The external environment also needs to be identified in the value chain analysis. It's made up of policy, markets, environmental and social issues. In addition, it's important to find out who can offer Business Development Services (BDS) and at what cost.

Strategic business plan development

This is composed of the following:

- Marketing and its four components - product, price, distribution and promotion;
- Operations - guidelines and systems;
- Personnel - capacity of the participants to implement the plan in the target channel and existing governance structure; and,
- Financing - developing capacity in financial management systems.

Production capacity and product development

This takes the form of two stages:

1. Commercialisation - by evolving producers into business support units through group dynamics, record keeping, financial management, business skills, and market exposure through value addition.
2. Developing producer capacity to comply with the following areas:
 - Legal business requirements;
 - Produce and bulk quantities required by the market;
 - Satisfy the target market quality assurance; and,
 - Consistent and on time supply.

Market access and development

Farmers and other project participants require access to market information. Market access involves identifying the market channel in which to participate competitively, profitably and sustainably. These could be local markets, Regional markets or international markets. Niche markets can also offer more opportunities through fair trade, high value crops, product development and value addition.

Partnership with the private sector is crucial to the success of these initiatives. This can come through the provision of BDS services, transport, product awareness, packaging, credit and quality assurance. The private sector being the engine of the economy needs to be engaged in the marketing of produce.

Financing of business operations

This would involve the identification of available capital base by the promoter and ability to access additional capital for business growth. Institutionalising financial management systems is important for any business operation. This adds to organisational credibility and makes it easier to access affordable credit.

Closing Session

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Marketing And Policy Issues

Finally, a cost-benefit analysis should be conducted to establish the Return on Investment (ROI). This can be very tricky if the new business is initially making losses.

Discussion and response from participants

There was a request for clarification on the connection or interface between MATF's work of funding technology transfer and the business model presented. A participant also commented on the usefulness of the topics presented as a valuable checklist for funded projects aiming to access markets in the form of business units. However, the lesson in the presentation was for producers to ensure that they get firm commitments from market players before delivery. They should also take advantage of all marketing opportunities while being flexible.

The discussants responded to the comments raised by clarifying that the presentation was mainly about market access rather than marketing; simply availing the products from the projects to different markets. They further clarified that examples from MATF funded projects had shown that some projects were designed to address only the issues of food security and nutrition as opposed to market access. The discussants added that it would be prudent for projects which initially started that way, to first carry out research to establish whether the market actually needs the product before launching into marketing activities.

The discussants proposed that for future MATF projects, the project design from the onset should make it clear whether the project will be market-led (and the technology identified to support this) or product oriented. Indeed, the business model presented indicates that technology comes in as an important component of the business development services.

From participant responses, it was observed that two clear models of MATF projects seem to emerge. One type starts off with the technology while the other starts with markets in mind. The MATF initiative itself, started with the technology aspect but it is gradually moving into marketing through scaling-up.

Emerging policy issues

Policy issues varied depending on the project location within the three East African countries. They mainly arose at start of the project, during implementation and at project exit, in the form of micro-finance access, export markets access, extension services and the transfer of technologies across countries. The packaging of produce in some market oriented projects had to address rules on standards and certification.

It was observed from the various presentations that many projects took advantage of emerging favourable policy environments to disseminate technologies rapidly and access new markets. These were mainly policy changes encouraging funding opportunities and revitalisation activities in agriculture. Some were not so favourable though. The gari processing technology is an example where engaging policy makers to gain entry into certain markets could be tricky and a hard sell. It would be easier for project implementers to raise issues to do with infrastructure in order to influence favourable policy change.

An example where active engagement with government worked was with the SITE beekeeping project in Taita Taveta district, Kenya. A joint document, on compliance to government regulations, was produced, enabling the project to meet its targets. In Uganda, MBADIFA's engagement with a government policy that might not work for its project was centred around plans to build a government post-harvest plant. MBADIFA needs to establish whether project output and farmer's incomes would be improved. Elsewhere in Uganda, positive policy outcomes were seen through the active influence of the orange fleshed sweet potatoes project by Makerere University. They organised schools to take advantage of local government funds to help in adopting the crop production technology.

It was also noted that even as the issue of export markets was being tackled, there was little interaction with international conventions, rules and trends. This had to

Closing Session

Policy issues discussant:

Charles Marwa

Policy and Research Officer,
FARM-Africa, Kenya

Closing remarks

Helen Altshul

FARM-Africa, Kenya Country Director

“The products and crops from these projects have contributed immensely to the nutritional well-being and incomes of many small-scale farmers.”

*Helen Altshul,
FARM-Africa, Kenya Country Director.*



change for the projects to profitably participate in these markets. Media and public awareness engagement was also crucial, especially through case studies from the projects. These would say what was working to forestall any changes in policy.

The above examples demonstrate the importance of understanding the public policy system and its impact on different projects. This process should be conducted before the commencement of project activities.

Discussion and response from participants

Participants agreed that the policy issues raised were very close to the marketing issues presented earlier. Others commented that sometimes opportunities lacked to discuss policy issues and their wider implications on projects. A participant mentioned the importance of talking to government officials to clarify on policy issues affecting a project with the aim of finding a way round the issues. The MATF fund manager wrapped it up by saying that the policy discussion was a learning opportunity for the Fund and that lessons arising would be inbuilt into a future MATF model.

Closing remarks

FARM-Africa's Kenya Country Director, Helen Altshul, gave the closing address to the workshop. She started by enumerating the diversity of technologies being promoted from the concluded Round 3 projects. She noted that the projects were dealing with a range of technologies, from apiculture, crop production, post-harvest processing to integrated natural resource management.

“The products and crops from these projects have contributed immensely to the nutritional wellbeing and income generation of many small-scale farmers,” she remarked. However, she had observed a few factors which still needed to be addressed for the farmers to realise the full benefits of these technologies.

Access to credit and managing the micro-finance components remains a challenge for some of the projects. The Country Director noted that poor record keeping hampered the operations of micro-finance aspects of the projects. Repayment rates remained low, but with a positive observation that women repaid their loans faster than men.

On the issue of project sustainability, she wondered whether farmer groups clearly understood their role in carrying out project activities after the funding period ended. She added that there was a need to ensure group participation was clarified to the members to ensure project continuity.

In supporting the vision of farming as a business, the Country Director called on farmers to be assisted in accessing markets where they could participate profitably, competitively and sustainably. She also pointed out the importance of considering policy issues at all stages of a project. While doing so, she encouraged participants to exploit opportunities for learning and sharing so as to build on their project experiences.

The Country Director concluded her remarks with a brief outline of the way forward for MATF. She talked on plans to embark on the Round 5 project funding with a call for concept notes before the end of the year. Besides the usual competitive tendering open to new applicants, this latest round of MATF projects would have a ‘purposive’ component which would build on the work of five selected projects from previous rounds, to generate greater impact. These are projects which had demonstrated ability to raise productivity at farm level through better linkages to markets, processors and capital. Funding would remain at £30,000 per year, for 3 years. A strong M&E approach would ensure that data on economic impact was well documented.

Helen Altshul closed the workshop by acknowledging the support provided by the Arusha Regional Commissioner, Donors Kilimo Trust and Rockefeller Foundation, MATF AP members, Dr Lydia Kimenye and the MATF team, George Odhiambo and FARM-Africa Tanzania staff, field visit organisers and workshop participants.

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