Africa Harvest

Annual Report 2010

Africa Harvest
BIOTECH FOUNDATION INTERNATIONAL

Africa free of hunger, poverty and malnutrition

A sorghum farmer holds a sheaf of sorghum that is their staple food in Itoleka

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Cover: Sorghum farmers traditionally threshing sorghum in Eastern province, Kenya

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Message from the Board Chairman, Dr Moctar Toure

It is with great pleasure that I write as the newly appointed Chairman of the Board of Directors of Africa Harvest. It is an honor to serve in this organization that has made significant strides in addressing hunger, poverty and malnutrition across Africa.

During the year under review, the African continent was still suffering the after-effects of the global food crisis with food prices steadily rising to the record highs of 2008. The La Niña atmosphere phenomenon has brought about the recent floods in Australia, China, USA and many parts of Southeast Asia and crude oil prices approaching US$ 100 per barrel are placing increasing pressure on the availability and affordability of nutritious food for the mainly rural poor population in Africa.

Despite a significant proportion of Africa's population directly or indirectly earning a living from agriculture, the rising global food prices do not translate to increased incomes for them. Most African nations are net importers of food. The vast majority of small-holder rural farmers still struggle to attain surplus produce or to get a good return from it at the marketplace due to poor quality of the produce, expense and inaccessibility of the markets or weak negotiating power against market intermediaries.

The whole value chain remains an important feature of how Africa Harvest adapts a new technology or innovation to be relevant to the needs of and act as a catalyst for, the empowerment of small-holder rural farmers and their communities. The Gadam Sorghum Project, Alliance for Green Revolution in Africa (AGRA), Tissue Culture (TC) Banana Project and the Public Engagement Strategy Study are examples of how this feature has successfully brought about sustainable rural development in eastern and central parts of Kenya.

The Board notes the multinational efforts that the organization is spearheading in establishing seed systems in Zambia and Malawi, the ongoing transgenic sorghum research and development work in Nigeria, Kenya and Burkina Faso, and the sensitization on plant biotechnology and advocacy on biosafety in Kenya, Uganda and Burkina Faso.

The Board is challenging the organization to broaden its horizon to include climate change, water management and environmental conservation though new partnerships, developing new knowledge and initiating new projects. These areas will be critical as climate change will impact Africa's agriculture in the coming years. Organizational capability and strategy have been enhanced through a strategic review by an international management consulting firm, to facilitate growth over the next 10 years.

I am glad to report that the Board kept its tradition of holding three meetings annually and has continued to ensure excellence on matters of governance, finances, audits and evaluation of overall performance on par with international standards. We also appreciate the CEO, Management and Staff for their perseverance and consistent effort in making 2010 a successful year.

Message from the CEO, Dr Florence Wambugu

Africa Harvest has continued with its commitment to help farmers and their communities achieve food security, address malnutrition and improve their economic well-being in a sustainable manner. This has been possible though the combined efforts of partnerships with like-minded institutions, the harnessing of resources through networks, participation in the international discourse over development issues and the tireless effort by Africa Harvest staff.

Celebration marked the end of Phase I of the Africa Biofortified Sorghum (ABS) project. The project has created the world's first transgenic, nutritionally enhanced sorghum with enhanced levels of vitamin A and bioavailable iron and zinc. Phase II of the project has commenced with further technological work to enhance and stabilize vitamin A as well as confined field trials (CFT) in Kenya and Nigeria and greenhouse experimentation in Burkina Faso.

The Africa Harvest flagship, Tissue Culture (TC) Banana Project has progressed through funding by the Alliance for Green Revolution in Africa (AGRA). Over 28,000 farmers representing 280 groups have planted nearly 200,000 TC plantlets. The farmer-led National Banana Association continues to grow through outreach to different parts of Kenya.

The Gadam Sorghum Project that started last year has had two successful seasons with the volume of surplus grain increasing steadily by season. The project has improved the lives of many farmers in the arid and semi-arid areas both through improved incomes and quantity of grain stored for food consumption.

The Public Engagement Strategy Study funded by the McLaughlin Rottman Center, completed its activities in 2010. The study developed a model on how to engage stakeholders in the introduction of new crop variety in an area. It developed methodologies on how value chain interventions and public acceptance techniques can support the introduction and acceptance of a new agri-technology within a farming community.

The CropLife project continues to support the establishment of the provisions of the Kenyan Biosafety Act and prepare the ground for the launch of Bt Cotton that is expected within a few years. In Uganda, advocacy work is continuing with government, public and private sector stakeholders for the Biosafety Bill in parliament. In Burkina Faso, the success of Bt Cotton is being expanded to Mali and Togo.

The Africa Harvest Board of Directors also welcomes Dr Moctar Toure as the newly appointed Chairman. The Board also recognizes the faithful service of Mr Andrew Fish who completed his tenure. We believe that the new Board members will lead Africa Harvest into a new phase of growth and ensure that it remains true to its vision of Africa free of hunger, poverty and malnutrition!

Introducing Africa Harvest

The vision of Africa Harvest Biotech Foundation International (AHBFI), also known as Africa Harvest, is to be a lead contributer towards an Africa free of hunger, poverty and malnutrition through the use of science and technology to help the rural poor achieve food security, economic well-being and sustainable rural development. African agriculture is dominated by resource-poor small-holder farmers, who face various challenges in food production, income generation and access to adequate nutrition. To supplement international and governmental approaches, Africa Harvest focuses on "bottom-up" interventions that primarily empower the small-holder farmers to access new knowledge and agricultural products and remove barriers and bottlenecks through the Whole Value Chain strategy so that they can derive benefits from the technology. Africa Harvest also participates in developing new agri-technologies and plays a vibrant role in the international debate on agricultural research, community development, climate change and environmental conservation issues.

The organization is non-governmental and non-profit in nature with headquarters in Nairobi, Kenya; regional offices in Johannesburg, South Africa which are specialized in the communication function; regional offices in Washington DC, USA; and a newly established office in Montreal, Canada. These offices are dependent on each other and they provide a mix of services and skills as well as locational advantages to the organization.

With an annual operating budget averaging US$4 million and a staff complement of about 40 employees, the organization operates four key programs, these being the Technical Program that includes Regulatory and Biosafety components, Technology Deployment Program, Communications Program and the Finance, Administration and Business Development Program. These programs support the implementation of 14 institutional projects across 11 African countries that range from agricultural research such as the Africa Biofortified Sorghum (ABS) Project, small-holder farmer interventions such as the such as the Tissue Culture

Visit of former Senator Thomas Daschle to Africa Harvest TC Banana projects: Above left: Senator Daschle addresses the farmers, Bishop Kariuki Center. Right: Joel Mutisya explains a point to Senator Daschle at the KARI biotech laboratories

Banana project, community engagement studies such as the McLaughlin Rotman Project and communication on plant biotechnology through the CropLife Project.

Africa Harvest is governed by an internationally represented, highly reputed Board of Directors providing expertise and governance in the areas of science, business, public policy and community development. The organization has also developed strong partnerships with a wide profile of international institutions, regional and pan-African organizations as well as public and private national and local firms for the purpose of implementing projects and promoting African agriculture, science, technology and environmental agenda.

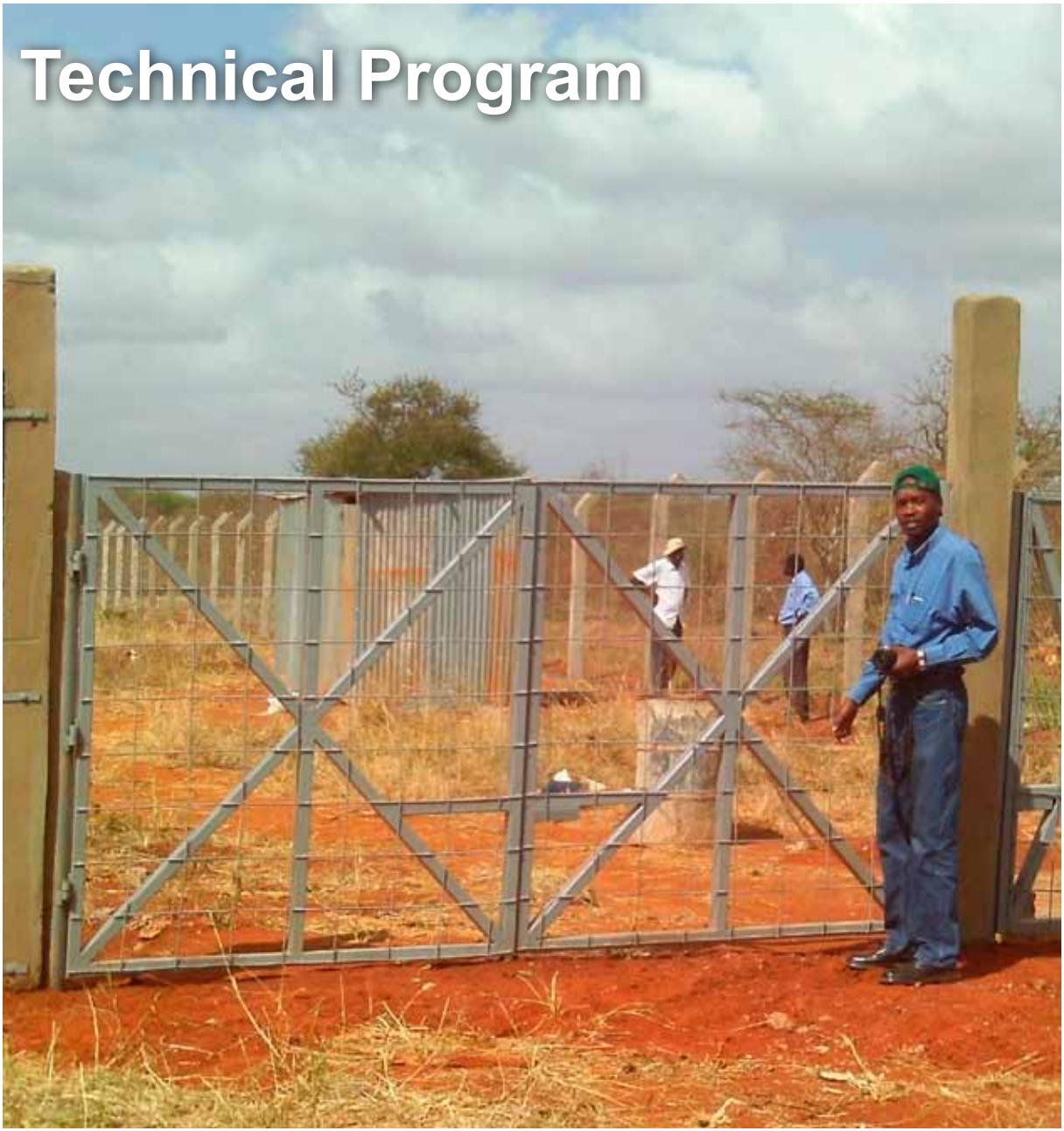
Dr Wambugu presenting a Participation Certificate to Ms Phoebe Asiyo, Provincial Director of Agriculture, Coast Province, Kenya

Participants during a biotechnology training workshop for Provincial Directors of Agriculture in September 2010

Dr Florence Wambugu, CEO Africa Harvest, Maj (ret) Gideon M'miruri Chairman, National Banana Association, Ms Mary Onyango, Ministry of Agriculture and Dr Ephraim Mukisira, Director, Kenya Agricultural Research Institute (KARI) cut a cake during the launch of National Banana Association

Ms Esther Gachugu, an early TC banana adopter, gives her testimonial during the NBA launch in August 2010

Technical Program



Africa Biofortified Sorghum (ABS)

June 2010 marked the end of Phase I of the ABS Project. At that time, the project had made remarkable progress in developing the ideal ABS variety with full nutritional complement. Targets have been achieved in improving protein quality, especially significant increases in the amino acid lysine. Also several food technology tests indicate that there is no significant decrease in the digestibility of proteins within the sorghum grain through the reduction of protein-binding kaffirin molecules. The enhancement of vitamin A has been marked by a golden color in the grain endosperm. Beta-carotene has been recorded at 31 micrograms per gram of grain. In addition, the nutritional traits have displayed stability up to four generations through field trials conducted in Hawaii, Puerto Rico and Iowa in the United States.

These results are displayed in the figure below.

Phase II of the project which started in July 2010, aims at enhancing the technological gains made in the project. Three key objectives to be achieved are:

Trait	Target	Status
Protein Quality	- 100% increase in lysine - 20% increase in tryptophan - 20% increase in threonine	- Lysine increased 30% –120% - Tryptophan increased 10% – 20% - Threonine increased 30% – 40% - Leucine decreased 20% – 30%
Protein Digestibility	No digestibility decrease as a result of cooking	- >90% gamma kaffirins suppressed - Achieved goal of no digestibility decrease on cooking
Iron and Zinc Bioavailability	- 80% phytate reduction - 20% iron bioavailability - 20% zinc bioavailability	- Phytate reduced 85% - Iron bio-absorption increased 20% – 30% - Zinc bio-absorption increased 24% – 40%
Vitamin A	10 micrograms of beta-carotene bioavailable per gram of sorghum grain tissue , stable for at least six months	- Yellow sorghum endosperm - Beta-carotene increased to 31 micrograms per gram of tissue, 30 days after harvest
Trait Stability		- Stable in six lines including four African lines - Stable at least in four generations - Backcrossed to six African varieties

1. Increase pro-vitamin A levels within the grain
2. Stabilize pro-vitamin A levels from harvest through storage
3. Conduct further bioavailability studies on iron and zinc relative to the reduced levels of phytate

One key challenge is that pro-vitamin A that is stored as the molecule beta-carotene in the grain, tends to degrade over time. Noting that vitamin A deficiency is widely prevalent in Africa, the beta-carotene degradation implies that grain that has been stored for three months can lose over half of its vitamin A content, thus becoming diminished in nutritive value. Pioneer Hi-Bred International, a DuPont business, is leading the technological efforts in both stabilizing and increasing pro-vitamin A levels so that consumers can benefit even after long periods of grain storage (target set at 10 micrograms of beta-carotene per gram of tissue after six months of grain storage).

Bioavailability studies on iron and zinc are continuing at the University of California Davis and the University of Pretoria, where non-transgenic and transgenic sorghum materials with different levels of phytate reduction are being tested further. Also, bioavailability studies on pro-vitamin A are being done in collaboration with Purdue University. Harvest Plus, a nutrition-based non-profit organization, is providing consultancy expertise to all of the work which is expected to provide substantive results later in 2011.

Another major accomplishment is the construction of five new research varieties or vectors, containing the genes for pro-vitamin A improvement, and all of the five research varieties are in the transformation process while three of these are growing in the greenhouse.

Other achievements include ABS transgenic seeds harvested in Iowa in October 2010 that are available for analysis or sending to African target countries. Also, analysis has confirmed that the phytate reducing gene can reduce up to 85% of the phytate content in the sorghum grain. Also, an eighth ABS confined field trial (CFT) has been planted in Hawaii, United States in November 2010.

Setting Confined Field Trials (CFT) in Africa

The Biosafety and Regulatory component of the ABS project focuses on the backcross of the research varieties into local sorghum varieties adapted to the environment within the target African countries. Within Phase II, these activities take on added significance as the vectors or research varieties have been prepared by the technology group in South Africa and the United States and the seeds are ready for planting.

Kenya, Nigeria and Burkina Faso are the three initial countries targeted for deployment of the project. The three countries have active biotechnology policies and biosafety/quarantine regulations that enable the CFT to take place. Of the three, Nigeria is the only country without biosafety legislation that enables deregulation and commercialization of genetically modified products. However, the local research institutions with support from regional organizations have been conducting training of government personnel and advocacy for the legislation with members of the national assembly. A Biosafety Bill was passed by the Lower House in July 2010 and it is currently being debated in the Senate with the hope of being passed in the near future.

In light of the regulatory circumstances, the Regulatory and Biosafety team set forth the following

four immediate objectives to be achieved as Phase II begins:

1. Obtain required permits and conduct CFT in Kenya and Nigeria
2. Obtain required permits and conduct greenhouse trials in Burkina Faso as a prerequisite before CFT can begin
3. Conduct gene flow experiments on the impact of ABS nutritional genes on the fitness of hybrids formed from cultivated crossed with wild species
4. Generate the regulatory core package data for deregulation process

In Kenya, the CFT application being prepared by Africa Harvest in conjunction with the Kenya Agricultural Research Institution (KARI) on behalf of the project, has been passed by the Institutional Biosafety Committee and has been submitted to the National Biosafety Authority (NBA) in November 2010. A study of the flora within the CFT locality has been conducted by a consultant from the University of Nairobi. The study revealed that there were no sorghum wild relatives found within a 1000 meter radius of the proposed CFT site, thus minimizing the possibility of gene flow through pollen transfer. A contractor is constructing the CFT site and is anticipated to be ready in January 2011, and depending on the NBA approval, the first trial season will commence in April 2011.

In Nigeria, Africa Harvest and the Institute for Agricultural Research prepared the CFT application that has been passed by the Institutional Biosafety Committee and has been submitted to the NBA in November 2010. Delays in the construction of the project CFT has necessitated the temporary use of a previous cowpea CFT site for field experimentation, scheduled for March 2011 pending approval from the NBA. The team also held an information sharing workshop with biosafety regulators in Nigeria. The regulators were informed on the background and technical information concerning the ABS project and in turn, they expressed their expectations to the team. Also, a forum was created for the project partners and regulators to interact and exchange information for their benefit.

In Burkina Faso, the Environmental and Agricultural Research Institute (INERA) submitted an application for a permit for greenhouse experimentation that was subsequently approved. However, there have been delays in securing a contractor to build the greenhouse but it is expected to be complete next year with experimentation scheduled to begin in June 2011.

Development in Gene Flow Studies

Experiments to assess the environmental impact of gene flow from the ABS to wild relatives of sorghum are in progress at the University of Nairobi, conducted by PhD student Mr Titus Magomere. This study is utilizing non-transgenic varieties. The study will look at the fitness of hybrids obtained from pollination of the selected ABS crop varieties with wild sorghum varieties that will provide information on and indicate the potential ecological consequences of integrating the elite sorghum into cropping systems. These experiments are being carried out at the University of Nairobi in collaboration with Nebraska University. This may impede the process of allocating certain aspects of vegetative and reproductive fitness to specific alleles or genes.

Parents for the hybrids to be tested for competitive abilities have been selected based on the following parameters:

1. wide genetic variation between the crop and the weeds,

2. infertile crops and wild locally sympatric species (wild species in the same geographical areas) and synchrony or closest synchrony in dates to first bloom (wild species with flowers blooming at or near the same time as the crop species),
3. weeds of significant agricultural importance.

Three weedy sorghum accessions or types have been identified based on the said criteria and 20 seeds from the selected weedy sorghum accessions were obtained from the United States Department of Agriculture USDA and are being grown at the University of Nairobi greenhouse. So far, the wild relatives of the sorghum are being self-pollinated to achieve genetic homozygosity of the plants (similar pair of genes on both DNA strands) before crosses can be made. This is done because the collections and materials maintained in germplasm banks may be heterozygous (having a dissimilar pair of genes on identical portions along both DNA strands) due to outcrossing within species of the crop and the weeds. Preliminary result shows that the planted materials are phenotypically or visually similar on basic traits. Segregation is low on the traits of interest but the results need to be confirmed further using identified co-dominant markers.

Projects under the Technology Deployment Program

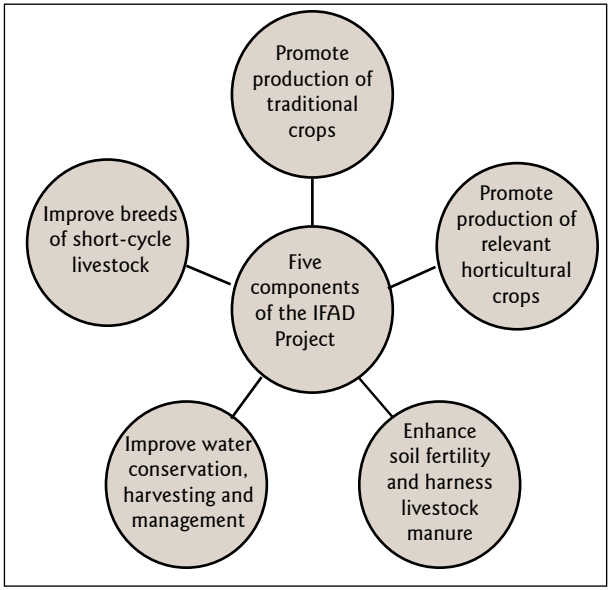
Introduction to the IFAD Project

The "Food Security and Ecosystem Management for Sustainable Livelihoods in Arid and Semi Arid Lands of Kenya" project also known as the IFAD food security project is funded by the International Fund for Agricultural Development (IFAD), a specialized United Nations agency that finances agriculture, community development and health projects in developing countries. The project was officially launched on 20th July 2010 by Dr Wilson Songa, The Agriculture Secretary, Ministry of Agriculture, represented by the Minister of Agriculture, Government of Kenya. The purpose of the IFAD project is to increase production, processing and marketing of horticultural and traditional food crops in three districts in Eastern Province, Kenya, through technical services that respond to the needs of the beneficiaries. This will be accomplished through improved food production, improved land and water management interventions, increased productivity and adoption of adaptive mechanisms to drought and climate change. The project uses an integrated approach with components focusing on promoting production of traditional crops, horticultural crops, short-cycle livestock, soil fertility and water management.

The project objectives guiding the integrated approach are listed as follows:

- Objective 1: To map out the current status in production of horticultural and high-value traditional food crops, short-cycle livestock, soil and water management as well as the corresponding technologies.
- Objective 2: To support and facilitate the adoption and production of adaptable and fast-maturing horticultural and traditional food crops.
- Objective 3: To enhance soil fertility and harness livestock manure use in improving agricultural productivity.
- Objective 4: To improve water conservation, harvesting and management.
- Objective 5: To promote adoption and the rapid improvement of short-cycle livestock.

In the initial rollout, Africa Harvest is implementing the project in Central, Wote and Mulala divisions located in Kitui Central, Makueni and Nzaui districts. The three districts are located in the lower Eastern Region of Kenya. Eastern Region has oneof the highest poverty levels in the country. From a provincial population of five million, over 2.6 million poor people are living below US$1 a day. These and other areas are frequently listed by the government for emergency food relief and have high levels of food and nutritional insecurity.



The project also aims at working with particularly needy groups within the communities represented in the project locations, such as:

1. Subsistence farmers producing crops for consumption at household level;
2. Subsistence farmers able to produce surplus farm produce for local market;
3. Traditional crop processors for local consumption;
4. Livestock farmers;
5. HIV and AIDS affected households;
6. Rural unemployed and underemployed men and women;
7. Local consumers of horticultural farm produce and traditional crops; and
8. Local horticultural farm produce dealers.

Africa Harvest Launch of the IFAD Project: Pictorial Section

Figure 1: Dr Wilson A Songa, Agriculture Secretary, Ministry of Agriculture, Kenya (left) and Mr Eric Rwabidadi, IFAD Associate CPM, Kenya (right) during the project launch

Figure 2: Mr Leone Comin, Water Sector Coordinator, Embassy of Italy in Kenya (left) and Dr Florence Wambugu, CEO Africa Harvest, (right) during the launch


Figure 3: Invited guests at the project launch

Results of Baseline Survey

This baseline survey was conducted within the project districts to map out the status in production of horticultural and high value traditional food crops, short cycle livestock, status of soil and water management as well as the corresponding technologies. The questionnaire administered by Africa Harvest also gathered information on quality of life indicators of households. The results are displayed in the table below:

Baseline Survey Results

- About 80% of the households were food insecure and relied on food aid for half of the year.
- Only 50% of the households grew drought-tolerant crops suitable for the arid region, a practice that perpetuated the cycle of food insecurity and poverty.
- Where suitable crops like sorghum were grown, poor agronomic practices resulted in low yields of about 400 kilograms per acre compared to optimal yield of about 2 metric tons per acre.
- A significant number of the participating households had limited crop and livestock production due to:
    - pests and diseases;
    - exposurte to the vagaries of erratic rainfall;
    - lack of markets;
    - low prices for produce;
    - poor road infrastructure; and
    - lack of capital to purchase inputs.

Partnering with Communities to Promote Water Harvesting and Conservation

Water conservation is the fourth objective within the IFAD project. The key activities undertaken under the water conservation component include sensitizing farmers on the benefits of conserving and increasing soil moisture. This is to be done by ensuring that surface run-off is minimized to allow water infiltration into the soil through structures such as terraces, retention ditches, tillage techniques and soil improvement practices. More training to build capacity in these efforts is set to be done in February 2011. The communities have learnt how to capture road surface runoff from rain water through exchange visits with other communities practicing these technologies. Also, they are utilizing roof garters and water storage tanks to directly capture rain water.

Farmers learn best when they see and communicate about initiatives from other farmers who have adopted technologies. Therefore, 51 representatives drawn from the 21 farmer groups, members and local leaders from the project target areas, were involved in an exchange program with the Mount Kenya Economic Productivity Project (MKEPP). This team had an excellent opportunity to learn and experience a similar initiative when they visited Mr Peterson Muriuki's farm in Gachoka division of Mbeere South District, an MKEPP project site, on 7th December 2010. The IFAD project community representatives interacted with Mr Muriuki on his ten acre farm where he has harvested road surface run-off, with the help of a retention ditch on which he has planted bananas.

To showcase and help promote rain water harvesting (roof catchment technology) in the wider communities, living in the project sites, the project

IFAD project farmer representatives during visit to Mr Peterson Muriuki's farm in Gachoka Division, Mbeere South District- an MKEPP project site.

chose schools as a good learning and reference point for not only the adults (parents) but the children as well. Three primary schools, (one primary school in Central, Wote and Mulala divisions respectively) were each supplied with a 10,000 litre water tank. The school community was responsible for the cost of installation and ensuring that a good gutter system was in place. The school selection was done in consultation with the area chiefs and community development assistants, guided by the following criteria:

- Be within the selected project target area.
- School enrolment and catchment area (number of school parents).
- Water-need assessment done with the help of area provincial administration and other stakeholders. This involved visiting of different schools in each division.
- Parents of the pupils attending the school become members of groups identified to work with the project.
- The school's willingness to participate in other facets of the project through 4K clubs-to rear rabbits or chicken as well as grow crops on school land.
- Good security arrangements to ensure that the tanks are in safe hands.

Schools that benefited from this initiative are: Iviani Primary school in Mulala Division, Kinguutheni Primary in Wote Division and Mwania Primary in Kitui Central with a total enrolment of 1092 pupils (411, 490 and 192 respectively). The installation of the water tanks has so far been done and the official handing over was also carried out on 2nd December, 2010. Therefore, promotion of roof water harvesting technology has benefited a total of 1,092 pupils and 29 teachers in the three schools in addition to 523 parents, giving a grand total of 1,644 persons.

Benefits accruing from the water harvested by the schools include the promotion of good hygiene for example, using the water for cleaning hands after using latrines. The water tanks also provided water for drinking and washing the classroom facilities. Also, the project is in the process of facilitating the schools to establish tree-seedling nurseries which will be watered using the water stored. A total of 1,644 people, including 1,092 school children from

Handing over of water tanks to Iviani (left) and Kinguutheni (right) Primary schools by the FOSEMSLIAK Project team

three primary schools, teachers and parents have started to benefit from roof water harvesting, the impact of which is to be assessed in the future.

Within this facet, the project is also expected to finance the construction of physical infrastructure including six water pans (two per district). So far, the project team has identified likely sites within the project areas for the construction of this infrastructure and will work in partnership with the district water management teams as well as the

Parents, Guardians and Pupils of Iviani Primary school during the meeting to present water tanks

provincial administration and other partners (the World Agro-forestry Center among others) to carry out the activities listed above.

Promote the Growing of Traditional Crops

In order to foster acceptance as well as sensitize the community on the goal and purpose of the project, awareness creation at different levels, targeting reference persons, the community and the trusted messengers therein was necessary. Awareness creation was achieved through undertaking the official launch of the project, followed by visiting relevant offices of key stakeholders within the project sites, and participating in various meetings, including community meetings (*baraza*) that are public forums convened by area chiefs.

Two awareness campaign activities held under the IFAD project

Having been targeted as the entry point to the community and having been provided with ample information about the project, the provincial administration (Chiefs, Assistant Chiefs) proved pivotal in reaching the farmers.

Traditional crop technologies and innovations were identified and promoted for adoption. Maize, sorghum, millets, beans, cowpeas, pigeon peas and green grams comprise the basket of choice food crops grown in the project areas as per the findings of the baseline survey. The project has so far identified sorghum as the key traditional cereal crop to be promoted in the project sites which are characterized by high temperature and also receive low and erratic rainfall. Sorghum is traditionally grown in the area. It tolerates flooding, heat and drought and is attacked by few post-harvest pests when compared to other cereals such as maize. In addition, the local communities are familiar with its preparation and often consume it as porridge, alcoholic beverage or breadstuff. The sorghum grain has a ready market as demanded by the Purchase for Progress (P4P) initiative of World Food Program (WFP) for food aid to other regions. In addition, Gadam sorghum is being purchased by East African Maltings Limited (EAML) for beer production.

Farmer field schools were set up in the target areas through the establishment of seven demonstration plots so as to showcase the best practices, from where farmers can learn and improve their production and productivity.

Prior to receiving training from Africa Harvest, farmers used inappropriate land preparation methods including slash and burn; and seed broadcasting was also a common practice. However, this trend is changing and line planting using optimal spacing is being witnessed in the project sites.

Africa Harvest distributing certified Gadam sorghum seed to the farmers

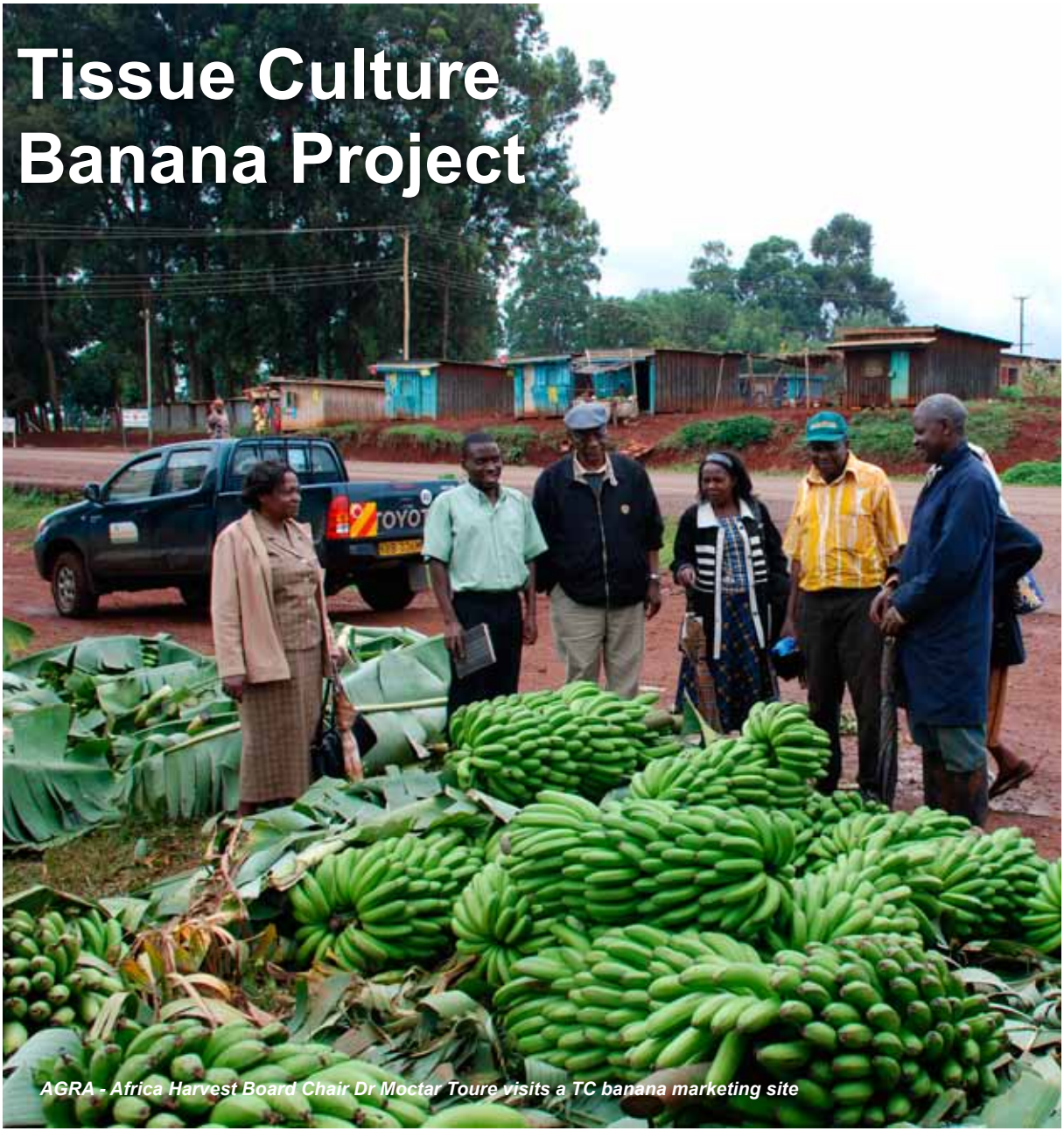
During the project period under review, adopting communities also visited other IFAD funded projects in Mbeere and they had exposure to new sorghum recipes and this is likely to increase the diversity of dishes which can be prepared from the sorghum grain.

Over the first six months of project's implementation, it had reached over 766 households where a total

A sorghum demo plot belonging to St. Camillus Women's group in Mulala Division, Nzaui district; shortly after planting in October 2010. Note line planting, uniform spacing and good weed control

of 5,991 kilograms of certified Gadam sorghum seed was planted and 1,497 acres of sorghum fields were established. Africa Harvest has projected a yield of 0.8 tons per acre that in effect doubles the previous farmer yields. This translates into 1,198 metric tons of sorghum grain. Based on the assured buying price of 17Ksh per kilogram, the participating 766 households will have a harvest worth Ksh 20,369,400 (US $252,878). It is anticipated that a successful harvest will be achieved in 2011 that will improve incomes for the farmers and attract others into the project.

Tissue Culture Banana Project



AGRA - Africa Harvest Board Chair Dr Moctar Toure visits a TC banana marketing site

Profile of the AGRA Project

The AGRA has funded the third project phase of the revitalization of the TC banana industry in Kenya. The two year project that commenced in May 2009 aims to consolidate the gains achieved in existing areas and expand the scope of the project to new areas in central and eastern Kenya, this being the former 13 districts named Muranga, Maragua, Thika, Kirinyaga, Nyeri and Meru Central, Meru South, Imenti South, Imenti Central, Imenti North, Tigania, Igembe and Embu.

The project optimizes the highly successful whole value chain implementation strategy that includes awareness creation with partners from the Kenya Ministry of Agriculture that includes field days, exchange visits and farm visits to sensitize and adopt new farmers into groups and enhance existing group management and dynamics. Access to high quality planting materials has also been enhanced through increasing the linkages to certified TC banana laboratories and broadening availability of TC banana hardening nurseries by training and supporting entrepreneurs.

Farm management has also been improved with more materials and in-depth training being provided to farmers on good agronomic practices involving site selection, input selection, planting, integrated pest and disease management, sucker selection, harvesting, post-harvest handling, value-addition and marketing. Also, a new module has been introduced that trains on indicators regarding fruit maturity.

Collaborating with other partners continues through enhancing linkages with private entrepreneurs who develop value-added banana products, K-REP and equity banks that provide microfinance, non-governmental institutions that supply water management expertise in certain regions and Technoserve that supports marketing in other regions.

To date, a total of 28,342 farmers have been reached and mobilized into 280 groups. Group members have been trained and a total of 231,527 TC banana plantlets have been adopted by group members, individual outgrowers and institutions. In order to facilitate access of certified and high-yielding TC banana seedlings to farmers in the project areas, nursery entrepreneurs have been trained in an intensive nursery establishment and management course. Also, 5 hardening nurseries have been established, inspected and certified by the Kenya Plant Health Inspectorate Service (KEPHIS).

Profile of the TC Banana entrepreneur

Mrs Rebecca Wamaitha, 62 years old, never expected to be a TC banana farmer. Residing in Amwari sub-location in Meru county, she had supported

Ms Rebecca Wamaitha of Kagaene CMA self-help group in Uringu division in Tigania West District cherishes a TC banana bunch in her orchard. This orchard was established in October 2008. Her income has been regular as she sells her bananas each month.

TC banana Grandnaine, a medium height variety performed best in this region in propping, bunch weight, finger quality, resistance to Fusarium wilt and its maturity period was most desirable.

her family by growing maize, beans, groundnuts and sorghum that brought meager income. She had even experimented with tobacco farming that didn't generate any profit. She says that cultivation of different crops on her seven acre farm resulted in just breaking even of her cost, leading to negligible savings and returns for her investments. She only benefited in feeding her family. Educating her six children was an uphill task for which she had to rely on sources other than her farm. Also, her husband who was diagnosed with a chronic illness was not able to work and she has struggled to pay his medical bills.

In May 2008, she attended a sensitization event on the TC banana project by Africa Harvest that was hosted by the Kagaene Catholic Men Association (CMA) at the local church. Despite being a woman, she became interested in and joined the Kagaene CMA self-help group. Later she was visited by Africa Harvest staff at her farm. Africa Harvest representatives prepared gross margin calculations that compared returns on maize, beans, groundnuts and pigeonpeas to TC bananas. She realized that the TC banana option was far more beneficial. After consulting with her older children, the household decided to establish a banana orchard of 45 plantlets.

The number of banana bunches, weight, average bunch weight, selling price and amount earned in the different months in the Mbeu banana market by Ms Wamaitha for the year 2010, is shown in the table below. Note that 12 bunches were consumed as food at home thus are not included in the table. Source of this information is the interview with the farmer, market group officials and data from the "Africa Harvest data tool" booklet.

Market period in 2010	Number of bunches sold	Weight in kgs	Average bunch weight	Price/kg	Amount earned (Ksh)
January	6	151	25.16	12	1812
February	9	240	26.66	12	2880
March	8	248	31	12	2976
April	7	223	31.85	10	2230
May	10	189	18.9	10	1890
June	10	287	28.7	10	2870
July	-	-	-	-	-
August	20	581	29.05	10	5810
September	8	304	38	10	3040
October	14	414	29.57	10	4140
November	12	420	35	10	4200
December	15	455	30.33	10	4550
Total	119	3512	29.51	10.36	36,398

Source- Mbeu Banana market records

Item bought	Expenditure in Ksh
Financing cultivation and maintenance of her TC banana orchard and the other crop enterprises	7,000
Bought a bull (in the photo)	5,000
Installed solar power panel and battery (she has been repaying a loan for the battery charger)	7,000
Household expenses—feeding her five grandchildren (and other expenses)	8,398
Education expenses for her granddaughters who are dependent on her	9,000
Total	**36,398**

Ms Wamaitha was also generous in sharing information on some of the significant expenses that she incurred in the year 2010, that she has been able to finance from her TC banana enterprise.

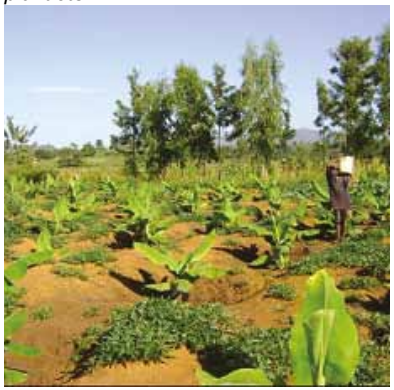
The bananas have been a nutritious source of food for her household and she has saved a lot from the remains of the harvested pseudo-stems and banana leaves because she uses them to feed her two cows. The family is now so excited by the success of the banana enterprise that her daughter decided to establish her own orchard of 400 plantlets in October 2010.

She adds that her orchard is performing so well that it has been used by her group, Africa Harvest and others for farmer exchange visits and training on orchard management practices.

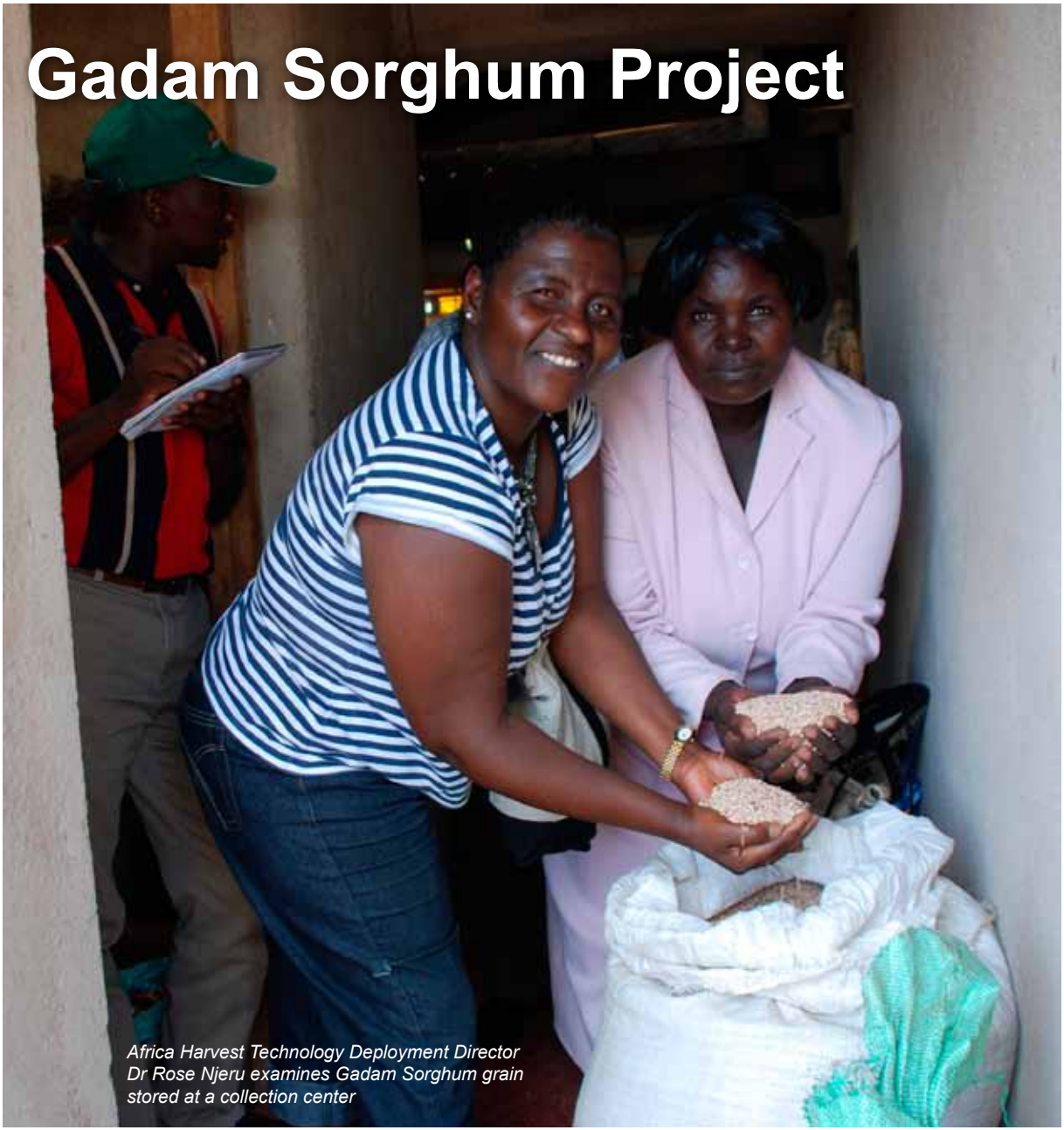
Ms Rebecca Wamaitha of Kagaene CMA self Help Group in Uringu division Tigania West District, with the solar system she bought from the proceeds of TC banana sales

Ms Rebecca Wamaitha of Kagaene CMA self-help group. She bought the bull with the income from the TC bananas

The 400 TC banana orchard was established in October 2010 by Ms Murochi) the daughter of Ms Rebecca Wamaitha. This was after the success of the initial 45 TC banana plantlet orchard in 2008. Seen in this photo is Ms Wamaitha's son tending to the plantlets



Gadam Sorghum Project



Africa Harvest Technology Deployment Director Dr Rose Njeru examines Gadam Sorghum grain stored at a collection center

The complete title of the Gadam Sorghum Project is, "Developing commercially sustainable and fast tracked sorghum value chains in Kenya, to support EABL raw materials' sourcing system". The project is a collaboration between Africa Harvest, East Africa Malting Ltd, seed multipliers such as the KARI and Western seed, several local seed distributors and farmers; and aims to remove bottlenecks and rapidly improve the sorghum value chain and secure sorghum grain supply for the company East Africa Breweries Ltd (EABL). Smart Logistics, Aberdare Technologies and Karweni Services provided the link between the farmers and the market.

EABL is the largest brewing company in Kenya and the East Africa region and East Africa Malting Ltd (EAML) is a fully owned subsidiary that manages its raw materials sourcing system. In 2008, sharp increases in the international market price for barley as well as an increase in the import duty of barley set by the Kenya government prompted several companies in the brewing industry to investigate sorghum grain as an alternate to barley for the creation of malted alcoholic beverages.

For sorghum to positively and sustainably contribute to the raw materials supply base for EABL, a deep understanding of the entire sorghum value chain, the barriers and bottlenecks, the strengths if any and leveraging the synergies accordingly, is critical. For example the understanding and streamlining of issues relating to market, management of varieties with good malting qualities such as Gadam, generation of baseline data and the perception of farmers on the credibility of the market outlet. In this project, Africa Harvest is focusing on developing a sound sorghum supply chain structure. The project goal is to have farmers in the upper Eastern Province of Kenya grow several tons of Gadam sorghum during the two growing seasons in 2010.

Africa Harvest started this project in 2009 is continuing this work as part of its corporate social responsibility activities. This means that the organization used its own internal funds to cover most of the project activities. The objectives of the project are to facilitate the access of certified and high-yielding sorghum seed through local seed companies and merchants, to enhance small-holder farmers the capacity to successfully grow high-yielding and agronomically robust sorghum varieties suited to their ecologies, to actively link the sorghum farmers to the market and to actively fast track or accelerate sorghum production to meet the EAML sorghum needs in part with the intention of increasing the volumes with time.

In the two seasons of year 2010, a total of 89,879kgs of sorghum seed was distributed to the farmers in the project region with the farmers eventually picking and planting 69,981kg. Grain collection at the end of the two seasons saw a total of 385,278kgs delivered to customers. Overall, a sum of Ksh6, 549,726 (US$ 80,612) was the income earned by farmers within the project area, from the sale of the sorghum grain, at a price of Ksh 17 (US$ 0.21) per kg. Detailed information is displayed in the figure on the next page.

In this first project year, it is still facing some initial challenges. Farmers only planted about 78% of the seeds that they were supplied out of concern that seed supply would also be delayed in the next growing season. Also, farms produced about 200kgs of grain per acre that was below the expected 500 kg per acre. Africa Harvest is still investigating on the various causes for the low yields but initial investigations indicate that bird damage and grain

Volume of Sorghum Seed Distributed, Picked, Planted and Grain Harvested in 2010			
	Seasons		
	First (Mar–July)	Second (Oct–Jan)	Total
Seed distributed (kg)	27,450	62,428	89,878
Volume of seed picked by farmers (kg)	16,839	60,966	77,805
Volume of seed planted (kg)	12,450	57,531	69,981
Volume of grain harvested (kg)	161,178	224,100	385,278

retention for farmers' domestic use are the most critical factors.

Unpredictable weather and erratic rainfall, poor sorghum production practices amongst farmers and reported cases of poor seed quality and an expensive seedling retail price of Ksh 130 (US$1.6) per kg are also issues being dealt with in the project. Despite this, Africa Harvest continues building capacity among small-scale farmers and working with partners to improve the value chain. It is confident that as more farmers are adopted, sorghum will be elevated to becoming a key commercial and strategic food crop for Kenya.

A Farmer Benefits from the Gadam Sorghum Project

John Musyoka Mulee, 63, hails from Kyunduani village, Kanyongonyo, Lower Yatta district. He is married with two children and four grandchildren. Back in the sixties, Musyoka worked as a casual laborer in Nairobi. His father had a small piece of land in present day Mwala district, where he farmed to feed his family of nine members (seven children, wife and himself). Owing to the land size (two acres), his family was always faced with food insecurity. He chose to quit his job as a casual laborer and relocated to Lower Yatta, where land was available on freehold. Hence, he did not pay anything for it. His main goal was to have his family as food–secure, as possible.

Musyoka belongs to Mutethya Kyunduani self-help group. The group is composed of 36 members (20 women and 16 men). The group began in 1998 with the aim of assisting members in increasing their number of livestock—goats and cows. The members meet once a month. Each member makes a contribution of Ksh 300 per month, which is given to one member, who then invests the money in livestock.

He owns a 40 acre piece of land on which he practices both crop and animal husbandry. His farm is well planned with different crops assigned to different sections of the farm. Previously, before the onset of the sorghum project, Musyoka had been planting maize as his main food/cash crop. He inter-plants maize with beans, green gram and cowpeas. On a separate plot, he plants cotton. He does this in rotation with the maize/legume intercrop. He also keeps livestock and he now boasts of 19 cows and 27 goats.

Musyoka used to grow sorghum in the nineties but later he stopped because it never did fetch a good price in the market. He once harvested 51 bags of red sorghum, which he sold off to a broker from Nairobi. With part of the proceeds from that sale, he bought four she-goats, which over the years grew in number to the herd he has today. When he heard of Gadam sorghum farming through the Africa Harvest community mobilizer—Jefferson Nzomo, he decided to venture into it because of the promise

of better price than there was before, the guarantee of a ready market through EAML and because it is also a delicacy—with the potential of improving food security for his household.

In October 2010, the first time he ventured into Gadam sorghum, Musyoka planted across 4 acres. He uses oxen to prepare his land for planting. He plans to gradually increase the acreage under sorghum in the coming seasons. Musyoka expects to harvest about two tonnes of Gadam sorghum in February 2011, that when sold at Ksh 17 per kg will give him a total of Ksh 34, 000 as his income.

Africa Harvest Invests through Corporate Social Responsibility

Sorghum is the ideal crop for food security in Kenya, states Africa Harvest CEO Dr Florence Wambugu. Several reports on climate change indicate that temperature rise over the next 50 years will bring increased occurrences of drought and flooding in the country while arable land will diminish due to increased effects of desertification and population pressure. Sorghum is not only drought tolerant but certain varieties are flood tolerant as well. As it is widely consumed in traditional meals across the country, it is also one of the few indigenous crops that are suitable to sustain populations in the arid and semi-arid lands (ASAL) in Kenya.

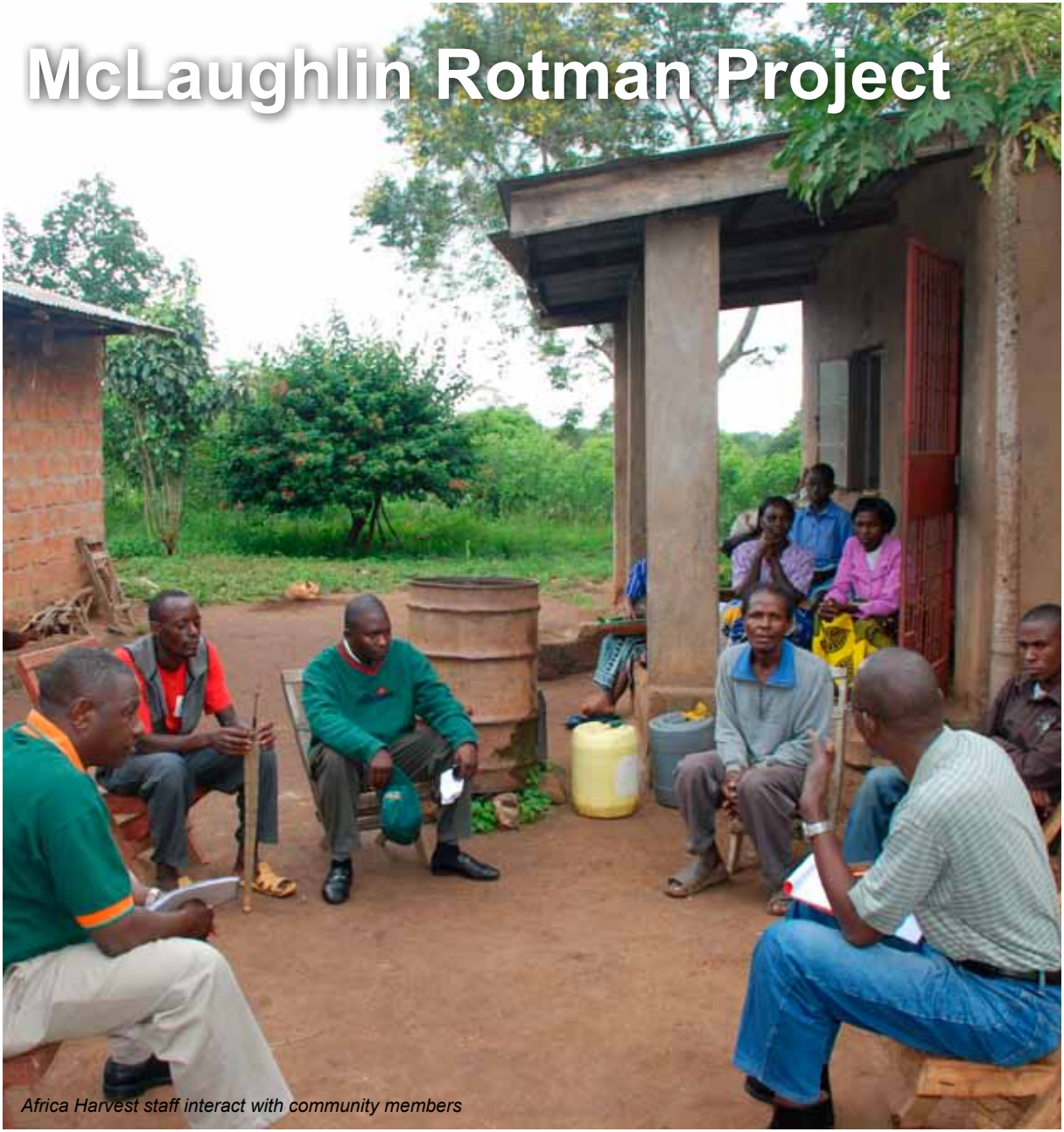
John Musyoka admires his already harvested grain in a granary. Note the sorghum is still in its heads

Sorghum is popular amongst many rural communities in Kenya but it has not developed into a viable commercial crop due to several problems in the value chain. "When East Africa Malting Ltd approached us to support them with addressing these problems, we saw this as a quick opportunity to really help resource poor farmers in these regions without taking a long time to search for a donor to fund this activity", stated Dr Wambugu. "The farmers know how to grow sorghum and have available land. The market is there as EAML is demanding over 90,000 tons of grain a year and is a credible buyer in the eyes of the farmers. All the value chain needed was a bit of unblocking and a slight push, to get it working."

The investment that Africa Harvest made through this initiative has been significant in terms of field mobilization, farmer extension services, preparation and distribution of seed and planting materials, farmer training and sensitization, publication of communication materials for farmers, coordination with partner institutions and data analysis and reports to various stakeholders.

Dr Wambugu indicated that Africa Harvest plans to continue these activities up to the end of the planting season ending in February 2011 and is aware that a World Bank project funded through the Ministry of Agriculture is likely to take over the work from that date, going forward. She is proud of the hard work and dedication shown by the Africa Harvest team in this venture and looks forward to an even greater commitment in social responsibility activities in the future.

McLaughlin Rotman Project



Africa Harvest staff interact with community members

Profile of the Public Engagement Strategy Study

The McLaughlin Rotman Center, situated in the University of Toronto, Canada, funded Africa Harvest to conduct a public engagement study titled "Public Engagement Strategy for Introduction of Nutritionally Enhanced Grand Challenge #9 Sorghum and Banana crops and products in Kenya". This study forms part of the knowledge management function within the Grand Challenge projects of which the ABS project is a part.

All the Grand Challenge #9 projects funded by the Bill and Melinda Gates Foundation involved creating a full range of optimal, bioavailable nutrients in a single staple plant species. All the projects were expected to show evidence of the proof-of-concept; that they had developed a nutritionally enhanced crop variety which expresses the nutritional traits, had demonstrated stability in the desired genetic background, and that there is evidence of biosafety approval by recipient countries. Also, there must be evidence that the product is acceptable by target beneficiaries by the end of the fifth year (Phase I).

Given the timeframe and the level of funding, it was important that the initial phases of community engagement commenced immediately. Therefore, the overall goal of this proposal was to design and pilot-test public engagement strategy for the introduction of nutritionally enhanced sorghum and banana in low and middle-income countries to counter micronutrient deficiencies in Kenya and Uganda. The specific project objectives were:

- To identify relevant stakeholders in banana and sorghum value chains and analyze critical issues and gaps for delivery of impact.
- To develop a public awareness strategy (based on identified needs and gaps) focusing on knowledge, information sharing, training and capacity-building.
- To create awareness in biosafety, regulatory and intellectual property right stewardship of genetically modified (GM) sorghum and bananas in Kenya and Uganda.
- To engage relevant stakeholders to enable them to participate in the "pilot testing" on the delivery of the products through the value chain, using selected non-GM banana and sorghum.
- To document the experiences and lessons learnt generated through the model so that it can be customized and replicated in other communities and countries.

Achieving these objectives was significant in that it helped the projects generate a clear understanding of how the target community would be impacted, thus providing a model through which the project implementers can understand the environment in which the products will be deployed, thus equipping them to generate effective and efficient product deployment strategies. The critical problems affecting the communities were identified and prioritized thereby helping model effective strategies to address these problems. Stakeholder analysis was conducted, giving a clear understanding of the characteristics of the relevant stakeholders, their interests and capacities. The study was also designed to guide the development of a project action plan and provide a benchmark for monitoring and evaluation.

Biosafety and regulatory issues still are a major barrier and bottleneck to the introduction of GM products in Africa. It is also noted that all four Grand Challenge #9 projects use GM technology in developing their nutritionally enhanced staple crop products. Therefore, this study purposed to create an understanding with the relevant stakeholders in the value chain in the target communities that would positively influence acceptance and delivery of the GM crops when they are deployed. Building capacity within stakeholders in the value chain was with the expectation of empowering people who will participate in the deployment of the product.

Africa Harvest launched the project in March 2009 with the intention that it was to continue for 18 months until September 2010. The study, modeled around the Itoleka Community in Kenya, was successfully completed within that time and a final report was submitted to the donor.

Itoleka Public Engagement Strategic Study

The Public Engagement Strategic Study funded by the McLaughlin Rottman Center had to be modeled around the introduction of a new crop and/or technology into a rural farming community. Sorghum was selected as the crop of choice and the area selected was Itoleka, a rural location consisting of 60 villages located in Kitui county in the Eastern Province of Kenya

It was selected as a suitable pilot site for the study as it had suitable weather conditions for growing sorghum and there was accessibility of farm inputs through local stockists. Also, farm sizes ranged from one to five acres, which is typical of farm holdings in Eastern Africa. Many people in the community were experiencing hunger and the location rated high on published poverty indices. Also, widespread farming of drought-prone maize implied that the introduction of drought-tolerant sorghum would make a significant and measurable impact on food and nutritional security.

After securing a research permit from the National Council for Science and Technology, Africa Harvest had an initial engagement with the local district officer, chief and administrative officials. Key stakeholders were identified through participatory approaches and these included farmers, village elders, opinion leaders, local administration, local policy makers and politicians, consumer representatives, Ministry of Agriculture personnel, sorghum processors and food industry representatives, nutritionists, and mass media journalists.

Preliminary data was gathered on economic, social, infrastructural, agronomic and nutritional indicators that revealed details on the wide extent of maize over sorghum growth within the location, unaffordability of quality seed and other inputs by local farmers, the extent and frequency of food relief efforts in the area, utilization of traditional farming practices, and similar facts.

Following this, a baseline survey using four sets of data collection tools (developed and pre-tested by enumerators) was conducted that analyzed critical issues and gaps affecting all the stakeholders in the community. One-on-one interviews were conducted with the key community leaders while focus group discussions were held among 149 randomly selected households picked from 12 randomly selected villages. The survey results highlighted issues such as the limited use of certified seed, diminished trust of market intermediaries, ineffective communication channels and non-credible messengers, poor perception of sorghum

as a commercial crop, and limited information on food and nutrition. There was very little awareness and almost no knowledge on biotechnology, especially GM technologies. Many of the respondents showed keen interest to learn and more so, to try the GM crops once they become available.

From the study, the communications program developed four key interactive messages as well as appropriate channels to reach the specific audiences. These tools were used to introduce the new crop variety known as Gadam sorghum. Selected community messengers were also trained on aspects of the crop as well as communications tools.

Following completion of the survey, a research feedback workshop was conducted, where 22 Itoleka community representatives evaluated, synthesized and developed a public engagement strategy that would effectively and efficiently introduce and domesticate Gadam sorghum within the community, over the remaining project period. The workshop included training on agronomic and business aspects of Gadam sorghum farming, biosafety, regulatory, intellectual property and stewardship issues on genetically modified technology, and on communication aspects such as talking points, messaging and presentation skills. Note that the Gadam sorghum being used is not GM in nature but is used to represent a GM crop.

This study was complete in September 2010 and the final report and the public engagement strategic model were submitted to the funders.

Africa Harvest Regulatory Officer Ken Mburu (standing) interacting with survey enumerators in preparation for data collection activities

Community stakeholders taking part in the Itoleka feedback workshop

Itoleka survey

Africa Harvest Program Officer Ms Tabby Karanja (standing right white blouse) giving instructions to survey enumerators

A video producer records a farmer interview in their field during the Itoleka survey

Africa Harvest intern Ms Njeri Abate (seated foreground) conducts an interview during Itoleka survey

Africa Harvest Regulatory Officer Mr Ken Mburu (standing) instructing enumerators on survey questionnaire

Africa Harvest Regulatory Officer Mr Ken Mburu entering a homestead in Itoleka location

An enumerator conducts an interview during the Itoleka survey

L to R: Video producer shares a break with Africa Harvest staff Ms Tabby Karanja, Mr Ken Mburu and Mr Israel Ikuro.

Survey enumerators receiving resources from Africa Harvest Program Officer Ms Tabby Karanja (seated)

Profile of LIFE's Heart Project

Banana planting demostration at Nchura Eshumata Narok

LIFE's Heart is a foundation that has an acronym that means "Living in Faith Everyday – Health, Education, Agriculture, Research & Technology". It was founded by an American couple named Timothy and Marcia Eller to improve the livelihoods of the Maasai community living in the Narok county, Kenya. Africa Harvest plays the minor but important role of introducing the TC banana and sorghum technology to these communities that traditionally keep livestock and have little knowledge of agriculture.

LIFE's Heart provided a grant to Africa Harvest for a year, starting from October 2010. Africa Harvest committed to set up demonstrations on sorghum and TC banana plots at different ecological zones within the Narok Maasai communities and sensitize the farmers on the benefits of diversifying into sorghum and banana. In addition, Africa Harvest partnered with University of Nairobi to gather data on soil fertility and the effect of the application of lime (calcium) on the yield and efficiency of crop production.

By the year end, Africa Harvest had already carried out initial sensitization and mobilization events amongst the Maasai in Narok county and had set up the demonstration plots during the October rainy season. Soil fertility and crop productivity trials are to be carried out in the following year. It is anticipated that the results of these efforts will occur later in 2011.

Pictorial of Life's Heart project Intervention

Africa Harvest hosts banana sensitization group training at Naroosura, Narok

Banana sensitization workshop at Naroosura Narok

Africa Harvest field officer Lucy Wandiri waters a planted tree together with the Maasai community

Africa Harvest staff Jane Ndiritu and Lucy Wandiri and Lifes Heart founder Marcia Eller share a light moment during a sensitization workshop at Nchura Eshumata, Narok

Workshop participants in training at Naroosura, Narok

Africa Harvest staff Jane Ndiritu facilitating at a sensitization workshop in Nchura Eshumata Narok

Communication for Development Program

CropLife Project

Africa Harvest is proud of its working relationship with CropLife International over several years. CropLife International is a global federation that represents the plant science industry by addressing international developments in crop protection and plant biotechnology. Since 2002, Africa Harvest Communication Program has collaborated with CropLife and its partner institutions to positively influence Sub-Saharan Africa to be more aware, knowledgeable and accepting of plant biotechnology. In 2010, the program has partnered with Africa Biotechnology Stakeholders Forum in some activities in Kenya and Uganda and is also active in Burkina Faso.

In Kenya, the promulgation of the Biosafety Act (2009) and the food crisis in 2008 heightened government and private sector interests in biotechnology and agriculture. Of interest has been the use of arid and semi-arid lands (ASAL) for production of staple foods to meet the food deficit experienced in the country. This is highlighted by the visit of the Vice President Hon. Kalonzo Musyoka to Africa Harvest sorghum projects in Eastern Province as well as briefing on the GM sorghum research being undertaken in Kenya.

Bt Cotton is expected to be the first commercialized transgenic crop in Kenya. Africa Harvest joined CropLife partner institutions and the promoters of the technology to create a Bt Cotton Taskforce that addresses various issues to ensure a suitable environment when the crop is commercialized.

The program conducted preliminary research in Eastern province and found that the majority of the respondents (90%) who are farmers are not aware of GMOs, however majority (98%) are willing to grow them while 92% are willing to consume;

The research further revealed that the Ministry of Agriculture Extension officers are the most accessible, available, affordable, acceptable, durable and trusted channel of public engagement whereas women rated local opinion leaders highly emphasizing the importance to enhance the capacity of Ministry of Agriculture officers in bio-safety issues, who in turn would empower community leaders and farmers.

The program then conducted training workshops on biotechnology for the eight Provincial Agricultural Extension Officers (PETOS) in May 2010 and their supervisors, the eight Provincial Directors of Agriculture (PDA) in August 2010 on biotechnology with reference to Bt Cotton. The trainings exposed how misinformed that these critical mid-level government officials were about biotechnology yet they were the delegated officials who monitored and implemented most government projects based on biotechnology. The workshop left them feeling more knowledgeable and ensured that they were connected to a resource network to aid further learning.

Biotechnology training was also provided to community radio presenters, as preparation for media channels to convey the message on Bt Cotton to target communities. Representatives from nine community radio stations attended the workshop hosted in June 2010 where they learnt about the science and applications of biotechnology with reference to the Bt Cotton research and development process. They also visited the Bt Cotton confined field trial site in Mwea, Eastern Province.

To promote biotech agenda in the academic world, Africa Harvest organized a field tour for Kenyatta University Biochemistry & Biotechnology Club officials to a Bt Cotton confined field trial site at Ahiti Ndombo, Eastern Province. The student officials were

able to experience and receive first-hand information on genetically modified crops, particularly Bt Cotton. They were sensitized on the importance of the technology for Kenya and encouraged to advance their careers in biotechnology.

In Uganda, passage of the Biosafety Bill through parliament is still a key priority. After conducting a situational analysis, Africa Harvest organized a biotechnology stakeholders roundtable meeting that brought together all key high-level stakeholders including the Ministry of Agriculture, Animal Industry and Fisheries, the Ministry of Finance, Planning and Economic Development (that is to table the bill), the Uganda National Council for Science and Technology, the National Agricultural Research Organisation (NARO) and representatives of the Cabinet Secretariat among others. The outcome of this meeting was the development of the Uganda Biosafety Bill Fast-Tracking and Lobbying Strategy that coordinated the efforts of stakeholders with an interest in the passage of the bill.

In line with the strategy, Africa Harvest in collaboration with Science Foundation for Livelihoods and Development (SCIFODE) and the National Semi-Arid Resources Research Institute organized a one-day Biotech Awareness and Training workshop in Soroti, Teso sub-region in Uganda, a potential deployment zone for Bt Cotton. The workshop focused on biotechnology research and development with special attention to Herbicide and Bt Cotton research currently on-going at National Semi-Arid Resources Research Institute (NaSAARI). The overall goal of the workshop was to provide knowledge, understanding and appreciation of biotechnology as

Africa Harvest sponsors journalists' visit to Bt Cotton field trials in Mwea Eastern Province, Kenya

a tool for agricultural development. The workshop was attended by aver 40 participants comprising of National Agricultural Advisory Services (NAADS) coordinators, District Agricultural and Extension Officers as well as some political leaders from seven districts in the Teso sub-region of Eastern Uganda. The districts represented included: Soroti (host), Serere, Kumi, Kaberamaido, Amuria, Ngora and Bukedea. Overall, there were eight policy makers and 32 agricultural extension officers and farmers attending the event. The policymakers and officers received training on biotechnology with reference to Bt Cotton.

Africa Harvest in collaboration with SCIFODE and NARO hosted an awards ceremony for excellence in biotech reporting amongst print and radio journalists in Uganda. The event forms part of the coordinated strategy to support passage of the biotech bill in Uganda. The award ceremony is a method to motivate journalists to develop new stories and report actively on biotechnology while deterring the fatigue that is likely after a long media campaign. The event was hosted on November 2010. SCIFODE and NARO conducted an evaluation of many submitted articles from which five journalists were recognized for excellence. Over 30 guests including the Director General for NARO participated in the event.

Burkina Faso has achieved great progress as being one of three African countries that have commercialized transgenic crops, this being Bt Cotton. As Africa Harvest was introducing the CropLife project to Burkina Faso for the first time, an extensive situational analysis was carried out where several representative from scientific research, academia, advocacy groups and media were interviewed on the prevailing political, economic, social and technological status of biotechnology

From the workshop, Africa Harvest concluded that the strategic thrust in the country was to defend, maintain and expand the gains achieved by biotechnology within the country. The government of Burkina Faso had commissioned a review of the Biosafety Decree (2006) through which Bt Cotton was commercialized. Despite having a rigorous and effective biosafety regime, the government deemed that the review was necessary so as to add components to the legislation that were not included

Delegates attending the Provincial Agricultural Extension Officers (PETOS) biotech training workshop held in June 2010

in the Decree. For example, since Bt Cotton is not consumed by humans or animals, the Decree did not have a section regulating food and feed safety issues.

Cognizant of the ever-present anti-biotechnology sentiments within this former French colony, Africa Harvest has been working with the Environmental and Agricultural Research Institute, African Biosafety Network of Expertise and other institutions to advocate and support the revision of the legislation in a manner that promotes the beneficial and responsible use of biotechnology. The review process is continuing to 2011.

Another critical observation from the situational analysis was that there is a significant group of scientists within the public research institutions that had negative sentiments on agricultural biotechnology ranging from indifference to strong antipathy. It was noted that in the most of these scientists had little or no information or understanding about biotechnology or even Bt Cotton. To reach this group, Africa Harvest developed a database, newsletter and website (www.biotechburkina.org) to provide factual information on biotechnology to various stakeholders in Burkina Faso. As of the report date, the database is complete but the website and linked newsletter are delayed as the program develops web design capacity in both English and French.

Publications and Websites

Africa Harvest Annual Report 2009

The Communications for Development program successfully published the 2009 edition of the Africa Harvest Annual report. The 78-page book described the activities and successes of the Technical and the Technology Deployment Program which cover the ABS project, the Tissue Culture Banana Project, the Trees for Energy Project, the Gadam Sorghum Project, and the Community Engagement Project.

The Annual Report of 2009 also covered the international outreach through media efforts of the Communication for Development Program; and the Finance, Administration and New Business Development Program.

The report documented Africa Harvest's sterling work in farmer group mobilisation, linking farmers to markets, training of trainers, developing entrepreneurs at grassroots level, communication, training of interns, financial administration, and staff capacity building.

The text of the report is interspersed with many pictures which allow the reader to obtain a visual understanding of the activities of the project.

Africa Harvest Communications Director Mr Daniel Kamanga with Burkinabe delegates attending the situational analysis workshop hosted at the INERA, Ouagadougou, Burkina Faso

Africa Biofortified Sorghum Five Year Report

Africa Harvest published the long-awaited ABS 5-year progress report, a stunning report on how the ABS project has accomplished its goals. The 115-page book is a product of the Communication for Development program. It outlines the successes and achievements of the ABS project during its Phase I tenure from July 2005 to June 2010.

The ABS project has surmounted daunting obstacles and created a workable partnership to successfully achieve the project milestones and more. According to the report, the goal of the ABS project is to develop a more nutritious and easily digestible sorghum that contains increased levels of essential amino acids, especially lysine, increased levels of pro-vitamin A and more available iron and zinc. This was accomplished through a consortium of nine African and two American institutions.

Important accomplishments include the product development roadmap, genetic transformation work by the Technology Development Group, and sorghum germplasm collection and analysis by the Product Development Group. Of particular significance is the development of the world's first golden sorghum with increased pro-vitamin A and improved zinc and iron bioavailability, reduced phytate (greater protein digestibility), successful field trials, successful food product trials, technology transfer, capacity building (scientist training and infrastructure development), and partnership management.

The major message of the report is that, at the end of its first phase, the ABS project had achieved all its milestones and was one of the projects in GC-9 and GCGH challenges to achieve all its molecular targets.

The well-worded book contains lots of pictures and diagrams of the project's activities, which will engage the reader and lead to a better understanding of the project's thrust. Once again, the Communication staff exceeded expectations by documenting the ABS project's first phase so comprehensively yet succinctly.

Scientific Publications

Within the year, there have been two scientific papers published by the ABS project that have been extensively cited and covered in scientific literature. The article Biofortified sorghum in Africa: using problem formulation to inform risk assessment' by Hokanson et al.'s (2010) published in the journal Nature Biotechnology sets forth a scientific method for approaching risk assessment issues for the transgenic ABS sorghum. The paper proposes a science-based problem formulation approach by which any possible harm can be contextualized and defined to help guide the data analysis process for risk assessment during the regulatory process.

The article The Importance of Dietary Protein in Human Health Combating Protein Deficiency in Sub-Saharan Africa through Transgenic Biofortified Sorghum by Henley, Taylor and Obukosia (2010) published in the journal Advances in Food and Nutrition Research sets the argument for the importance of dietary protein in addressing protein deficiency related diseases in Africa thus asserting the benefits that can be derived from protein and nutritionally enhanced ABS sorghum.

Websites

How information is presented is as important as the information itself. As Africa Harvest operates within the science, technology and agriculture spheres, the Communications for Development Program works hard to interpret and contextualize mostly scientific information at the level of particular audiences and deliver that information through a specified medium.

Internet access in Africa is rapidly growing due to improvements in infrastructure, proliferation of wireless access technologies and lower tariffs. Likewise, the continent is the world's most rapidly growing market for mobile telephony. By 2009, mobile phone users constituted around 90% of all African telephone subscribers and the device is fast becoming the preferred point of access to the internet especially amongst the youth.

Africa Harvest uses the internet to reach key stakeholder audiences such as government officials, scientists from agricultural, health and nutrition institutions, academics, industry representatives, non-profit and civil-organization representatives and students. The organization has a website that provides general information about the institution, and project-specific websites that divulge more detailed information.

The Africa Harvest official website (www.africaharvest.org) provides some general information about the institution. The website front page was designed to enable easier navigation and to interest various audiences with links to video clips, telecasts and an awards section. Publications are also highlighted in the front page with a more extensive list provided in the Resources page.

Two examples of project-specific websites are the official websites for the Africa Biofortified Sorghum (ABS) project (www.biosorghum.org) and the CropLife project information portal for Kenya (www.biotechkenya.org). Due to the sensitive nature of the projects or the mandates provided by the project sponsors, these websites, designed for specific audiences, tend to be succinct.

The Communications Program published two significant reports within the specified year. The Five-Year Progress Report of the ABS project was a six month effort that required extensive interviews of project participants, and research in the project archives to bring forth the five-year story of the successful first Phase of the project. The 2009 Africa Harvest Annual Report captures the changes, progress and achievements of the organization during the year under review.

Finance, Administration and Business Development Program

The Finance, Administration and Business Development program supports the organization in the areas of finance such as fundraising, financial stewardship and reporting. Administrative functions involve procurement and disposal of assets, maintenance of office facilities and assets, and other functions. Business development focuses on employee remuneration and benefits, human resources, stewardship over contract and agreements, corporate strategy and governance issues and other functions.

In 2010, Africa Harvest established new partnerships with SEUCO, a constituent college of the University of Nairobi in Kenya, the International Rice Research Institute based in the Philippines and Aberystwyth University based in the United Kingdom.

Africa Harvest signs MoU with SEUCO

The AHBFI entered into a MoU with SEUCO, a constituent college of the University of Nairobi. The agreement focuses on forging collaboration on research and development for food security and economic empowerment in Eastern Africa. The signing which was done by the CEO of Africa Harvest, Dr Florence Wambugu and the Principal of SEUCO Prof Geoffrey Muluvi, was informed by the fact that the parties share a common concern for the welfare of resource-poor small-holder farmers in arid and semi-arid areas of Kenya and recognize that they can work collaboratively to help marginalized communities to access farming technologies that can boost their food production, nutrition and income.

The parties agreed to explore and identify suitable products for transfer to small-holder farmers and coordinate activities of mutual interest and exchange technology tools (information, technology, capacity-building and materials). They will seek to jointly implement projects that focus on ensuring capacity-building in food security, promotions of sustainable agricultural development based on environmentally sound management of natural resources, enhancement of nutritional quality of diets, and provision of economic opportunities for resource-poor communities and society as a whole.

Africa Harvest Partners with Aberystwyth University

The AHBFI has entered into partnership with the Institute of Biological, Environment and Rural Sciences (IBERS) at Aberystwyth University. The partnership seeks to identify opportunities for improving agricultural development in sub-Saharan Africa by implementing projects that impact food security, poverty and environment.

Internship takes root in Africa Harvest

Africa Harvest has embarked on a new strategy in terms of intern recruitment and development. Previously, interns were hired on a temporary basis with Bachelor's degree qualifications. The challenge was that the capacity built within the interns had to be replicated each time a new set of interns worked in the institution.

Senior management decided to hire Master's degree qualified interns across various disciplines who could be deployed to manage new or existing projects. It is anticipated that this would reduce recruitment costs, retain capacity and ensure a smoother transition from interns to project managers.

In August 2010, the following four interns were hired into various capacities within the organization.

Dorothy Opondo is program assistant under the Biosafety and Regulatory department.

She is currently waiting to be awarded a Master's degree in Applied Parasitology from The University of Nairobi. For her research she compared *Schistosoma mansoni* and its intermediate host's proteins with the aim of finding common proteins which could then be studied further as vaccine candidates for schistosomiasis; a parasitic infection endemic in the tropics.

She holds a BSc in Zoology and Botany from the University of Nairobi and has previously worked with the University of Pittsburgh/KEMRI Project, Kisumu where she was involved in carrying out HIV diagnosis using PCR, DNA isolation, polymerase chain reactions and genotyping.

Dorothy has attended short courses on Molecular Biology and Research Ethics by Family Health International and Malarial Anemia and related co-infections offered by the Kenya Medical Research Institute (KEMRI) in collaboration with the University of Pittsburgh.

Anthony Aseta is a program assistant attached to the Chief Scientific Advisor. He holds an MSc Botany (Microbiology) and a BSc degree in Botany (crop protection), both from Jomo Kenyatta University of Agriculture & Technology.

He has a wealth of experience as a research assistant with agricultural organizations.

Kenneth Njoroge is a program assistant with the Technology Deployment Team. He holds an MSc in the Biology of Conservation and a BSc degree in Chemistry and Zoology, both from the University of Nairobi.

Ken possesses over four years' experience in environmental conservation and has a wealth of experience in proposal writing, project management and project implementation. Before joining Africa Harvest, he was a project assistant at KEFRI, where he was involved in the implementation of a Biological Control Program to control a pernicious pest affecting the eucalyptus tree. He has also been involved in the establishment of baseline surveys and projects that seek to promote environmental conservation as well as the wise use of natural resources.

Grace Mureithi is a program assistant at Africa Harvest's Nairobi office.

She is currently a student at the University of Nairobi, pursuing a Master's degree in communication and holds a BSc degree in Agriculture from the same university. She has also attended training in monitoring and evaluation, paralegal, HIV and AIDS and stigma counselling, among others.

Grace previously worked with Mukuru Promotion, a local development NGO and the NIC bank. Before Joining Africa Harvest, she worked for Integrated Rural Development Program (IRDP), in Eastern Province.

She also has experience in implementation and collaboration of development projects run by various NGOs such as PHIA II and WFP.

Board Matters

The Africa Harvest Board of Directors have been a critical factor to the success of the organization. The members have an international profile and exposure in terms of their professional and work experience. The Board assembles a wide range of expertise and diligently monitors the organization to ensure that it operates within its policy framework and available resources.

During the year under review, Dr Moctar Toure was appointed the Chair of the Board and replaced Mr Joseph Kibe who held the position in an acting

capacity. Dr Toure has extensive experience in agricultural research and policy, having worked in senior positions in the Global Environmental Facility (GEF) and the World Bank. He has worked in both government and public agricultural research institutions in his native country, Senegal, and serves within boards or consults for institutions such as the Consultative Group for International Agricultural Research (CGIAR) and the United Nations Development Program (UNDP).

Mr Andrew Fish's term on the board ended in May, after he served two consecutive terms. Mr Fish provided the board with policy and government affairs expertise, having worked in various United States government positions involving agriculture, food and nutrition, and forestry. The Board, senior management and staff of Africa Harvest thank Mr Fish for his dedicated service to the organization and look forward to collaborate with him in the future.

Staff Development

Annual Retreat

Africa Harvest staff participated in the annual retreat in August at Lukenya Getaway in Athi River, Kenya.

Africa Harvest senior management at retreat in Naivasha

The retreat was a welcome relief as the entire group participated in exercises and games that were fun, educational and built team spirit and cohesion amongst individuals.

The three-day program included a review of the various programs and projects within the organization as well as a feedback session on the organizational strategic review process that was occurring at that moment. Other sessions involved motivational and career development training as well as a presentation on maintaining individual health and nutrition.

Friday High Tea

The Friday High Tea tradition still continues where every staff member is invited to participate in a bonding and information-sharing meal. This event is an important part of the week where staff members informally talk about their activities, observations, ideas and thoughts as part of the information and knowledge management process. Special guests are occasionally invited to make presentations on topics deemed important for the staff members and the institution.

AH staff enjoying a fun exercise during 2010 staff retreat at Lukenya Getaway

Profile of Board Members

Dr Moctar Toure has succeeded Acting Board Chairman Mr Joseph Kibe. He has extensive experience in agricultural research and policy. He retired as the Team Leader of the GEF and served as Africa Agricultural Services Specialist for the World Bank. He has previously worked in various other capacities at the World Bank, Senegalese Institute for Agricultural Research (ISRA), Senegalese Ministry of Science and Technology and Ministry of Agriculture, Morocco.

He has served on the boards and committees of institutions such as the Forum for Agricultural Research in Africa (FARA), European Economic Commission, CGIAR, Africa Rice Center, International Center for Research on Agro-forestry (ICRAF), International Center for Insect Physiology and Ecology (ICIPE) and the International Board for Soil Research and Management (IBSRAM).

He currently consults for the UNDP, United Nations Convention to Combat Desertification (UNCCD), African Development Bank (AfDB), International Fund for Agricultural Development (IFAD) and the Government of Burkina Faso.

Mr Joseph Gilbert Kibe is the Vice Chairman of Africa Harvest. He is also Chairman of the Kenya Horticulture Development Authority and served as Permanent Secretary in the Ministries of Agriculture and Animal Husbandry, Commerce and Industry, Economic Planning, Water Development, Lands and Settlement, and Tourism and Wildlife in Kenya. He also currently serves as a director of more than ten private sector companies.

Professor Shabd Acharya, an Indian national, joined the board in April 2009. He is currently an Honorary Professor at the Institute of Development Studies, Jaipur, India. He was previously Professor of Agricultural Economics at the State Agricultural University and Chairman, Commission for Agricultural Costs and Prices (CACP), Government of India, Ministry of Agriculture, New Delhi from 1992 to 1996. He holds a Ph.D. degree in Agricultural Economics from the Indian Agricultural Research Institute and has contributed immensely to the field of agricultural economics and policies in developing countries of Asia and Africa. He is a senior policy consultant with the Food and Agricultural Organization (FAO); Vice President of the Indian National Academy of Agricultural Sciences; and a panel member of the Consultative Group on International Agricultural Research (CGIAR) Science Council.

Dr Mary Alton Mackey (Ag. Vice Chair and Chair Audit Committee) is an international health and nutrition consultant to the Canadian International Development Agency (CIDA), World Health Organization (WHO), United Nations Children's Fund (UNICEF), and CARE in maternal and child health. Dr. Mackey co-chaired the GE Food and Health Innovation Committees of the Canadian Biotechnology Advisory Committee to the Government of Canada from 2002–2008.

Ms Gisèle Lopes d'Almeida (Chair Governance Committee) is the founder and CEO of Interface, a network of CEOs and investors from small and medium African agribusinesses. She is also the founder of the West African AgriBusiness Network and serves as a member on numerous boards of trustees and committees in regional and international organizations, including SPAAR, Forum for Agricultural Research in Africa (FARA), Conseil Ouest et Centre Africain pour la Recherche et le Développement Agricoles (CORAF), and the CGIAR Private Sector Committee.

Dr Matin Qaim is a Professor of International Food Economics and Rural Development at the Georg-August-University of Goettingen, with research expertise in agriculture technology adoption and impact in Africa, Asia, and Latin America, including biofortified crops. He also serves on the Golden Rice Humanitarian Board and the Centro Internacional de Mejoramiento de Maíz y Trigo (CIMMYT) Board of Trustees.

Dr Florence Wambugu is the Founder, Director, and Chief Executive Officer of Africa Harvest. She serves as a Science Board member of the Bill and Melinda Gates Foundation Grand Challenge in Global Health; is a member of the Food Council of the World Economic Forum; and a Council Member of the Japan Science and Technology in Society Forum. Dr. Wambugu's many honors and awards include the Yara Prize and an honorary Doctor of Science degree from her alma mater, the University of Bath. She was the former Africa Region Director of International Service for Acquisition of Agri Biotech (ISAAA) AfriCenter and the Principal Research Officer with KARI.

Ms Prudence Ndlovu succeeded Mr Andrew Fish as Board Secretary. She is a human resource development specialist, who serves as Managing Director of EPOD Global Pty Ltd. Ms. Ndlovu is a member of the South Africa Business Women Association and the Institute of Directors.

Mr David Farber is Africa Harvest's Legal Counsel. Although not a Member of the Board, he serves as the Board Secretary. He is a Legal Counsel with Patton Boggs LLP and ensures institutional compliance as well as handling of all legal matters. He is the co-chair of the firm's Energy, Natural Resources, Environmental, Health and Safety practice group.

He maintains a broad and diverse legal practice, ranging from health care litigation and advocacy to health and safety regulatory work. Mr. Farber has particular expertise in health care regulatory and litigation issues, insurance law, health and safety (OSHA and MSHA) disputes, environmental law, False Claims Act (health care and environmental) litigation, trade secret and employment issues, and business counseling. Mr Farber has also helped organize and serves as lead counsel for several trade associations, addressing a variety of federal and state issues.

Africa Harvest staff

Communication for Development Program

Daniel Kamanga
Director, Communication Program

Julia Kagunda
Senior Communications and Administrative Officer

Benson Kariuki
Senior Communications Officer

Grace Muriithi
Intern, Africa Harvest

Michael Njuguna , Deputy CEO

Dorothy Opondo, Intern, Africa Harvest (2nd left),
Kennedy Njoroge, Intern, Africa Harvest (2nd right)

Anthony Aseta
Intern, Africa Harvest

Banana Project team

Wangari Kiragu
Senior Program Officer

Israel Ikuro
Field Assistant

Ken Macharia
Field Officer

Eugenio Kiogora
Field Officer

Onesmus Mwangangi
Field Project Coordinator

Regulatory Affairs

Dr Silas Obukosia
Director Regulatory Affairs

Tree Project Team

Phillip Wamahiu
Project Manager

Eliud Mutahi
Field Officer

Githinji Muriungi
Field Officer

Technology Deployment Team

Dr. Rose Njeru
Director, Capacity Building & Technology Deployment Program

Tabby Karanja
Senior Program officer

Paul Mugo
Field officer

Harrison Gatobu
Field officer

Technical Program

Stephen Mburia
Field officer

Simon Mwinzi
Field officer

Ken Mburu
Regulatory Officer

Finance, Administration and Business Development Team

Nehemiah Taylor
Business Development Officer

Mercy Muthui
PA, CEO

Rose Kanduthu
Procurement Officer

Hellen Mutiga
Finance and Administration Assistant

Gideon Ndichu
Senior Accountant

Terry Amaya
Administrative Assistant

Antony Korir
IT Administrator & PA Technical

Mumbi Maina
Administrative Officer

Chris Nganga
Office Assistant

Ane Njeri
Site Service Assistant

Robert Mwangi
Site Service Assistant

Summary of Financial performance

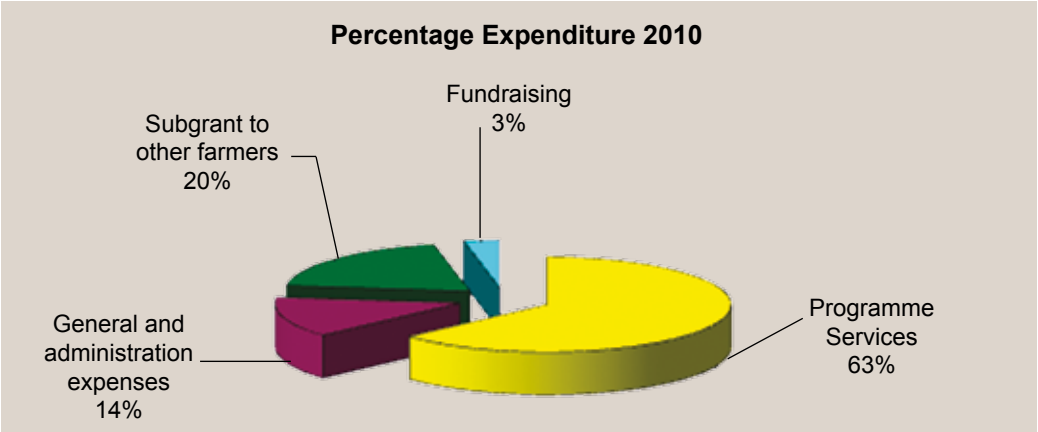
Funding

The Africa Harvest total grant income was US $3.201 Million in 2010. The revenue was mainly restricted donations from 11 donors and many individuals:

1. Bill and Melinda Gates Foundation
2. Alliance for a Green Revolution in Africa (AGRA)
3. International Fund for Agricultural Development (IFAD)
4. McLaughlin-Rotman Centre for Global Health
5. CropLife international (CLI)
6. East Africa Malting Ltd (EAML)
7. Danforth Plant Science Centre
8. Swiss Agency for Development and Cooperation (SDC)
9. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)
10. International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)
11. Life's Heart

Expenditure

Africa Harvest expenditures are grouped into four areas—program services 63% (2009:55%), general and administrative expenses 14% (2009: 11%), sub grant to Partners 20 %(2009: 33%) and fundraising 3% (2009: 1%). The amount paid to sub-grant organizations is used towards direct programme implementation which effectively means a total of 83% of all the expenditure was used in programme service. The implication of this financial allocation is that a greater proportion of the resources we receive is directed towards programme implementation in support to the foundation vision and mission.



Income and expense indicators

	2010 US $ "000"	2009 US $ "000"
Grant & Investment Income	3,201	4,509
Expenditure		
Programme Services	2,046	2,399
General and Administration Expenses	441	492
Sub grant to Other Partners	646	1,456
Fundraising	101	61
Total Expenditure	**3,234**	**4,408**
Net Surplus/(Deficit)	(33)	101
Other Comprehensive income		
Movement in foreign exchange reserve	-	100
Total Comprehensive Income	(33)	201
Cash-flow:		
cash and cash equivalent beginning of the year	3,823	4,030
cash and cash equivalent end of the year	1,065	3,823

Consolidated Statement of Financial Position at 31 December 2010
(Balance Sheet)

	2010	2009
ASSETS	US $ "000"	US $ "000"
Non Current Assets		
Property & Equipments	253	296
Intangible Assets	13	14
Investments	404	399
	670	709
Current Assets		
Receivables	414	483
Short term deposits	376	186
cash & bank balances	689	3637
	1479	4306
Total Assets	2149	5015
FUNDS & LIABILITIES		
Accumulated Funds and reserves		
Accumulated Funds	613	646
Foreign Exchange Translation Reserve	(3)	(3)
	610	643
Current Liabilities		
Unexpended Grants	1459	4263
Payables	80	109
	1539	4372
Total Funds and Liabilities	2149	5015

Africa Harvest 2010 donor profile

Africa Harvest duly acknowledges the financial support during the from the following donors:

Bill and Melinda Gates Foundation	The philanthropic foundation applies the belief that every life has equal value and 15 core principles in supporting several initiatives through the Global Development, Global Health and United States programs http://www.gatesfoundation.org
Alliance for a Green Revolution in Africa (AGRA)	AGRA works to achieve a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based on smallholder farmers http://www.agra-alliance.org/
International Fund for Agricultural Development (IFAD)	The International Fund for Agricultural Development (IFAD), a specialized agency of the United Nations to finance agricultural development projects primarily for food production in the developing countries. http://www.ifad.org
McLaughlin-Rotman Center for Global Health	The McLaughlin-Rotman Center for Global Health develops global health solutions to bring forth a world where everyone benefits from new diagnostics, vaccines, drugs, devices and other life science solutions http://www.mrcglobal.org
CropLife International (CLI)	CropLife International is the global federation representing the plant science industry that is committed to supporting sustainable agriculture through innovation in crop protection, plant biotechnology and seed production. http://www.croplife.org/
East Africa Malting Ltd (EAML)	East Africa Malting Ltd is a raw materials supplier and fully owned subsidiary of East African Breweries Ltd is East Africa's leading branded alcohol beverage business http://www.eabl.com
Danforth Plant Science Center	The Danforth Plant Science Center is a research center that focuses on improving the human condition through plant science http://www.danforthcenter.org/
Swiss Agency for Development and Cooperation (SDC)	The Swiss Agency for Development and Cooperation (SDC) is Switzerland's international cooperation agency within the Federal Department of Foreign Affairs (FDFA) that focuses on development cooperation to reduce global poverty. http://www.sdc.admin.ch

Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA)	The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) is a non-political organization of the National Agricultural Research Systems (NARS) of ten countries that aims at increasing the efficiency of agricultural research in the region http://www.asareca.org
International Crops Research Institute for the Semi- Arid Tropics (ICRISAT)	The International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) is a non-profit, non-political organization that conducts agricultural research for development in Asia and sub-Saharan Africa http://www.icrisat.org/
Lifes Heart	Life's Heart is a charity founded Timothy and Marcia Eller to support agriculture amongst the nomadic Maasai community in Rift Valley province, Kenya

Africa Harvest Board of Directors interacting with sorghum farmers in Mwingi Eastern Province, Kenya, May 2010

Acronyms and abbreviations

ABS	Africa Biofortified Sorghum
AHBFI	Africa Harvest Biotech Foundation International
AfDB	African Development Bank
AGRA	Alliance for Green Revolution in Africa
ASAL	Arid and Semi-arid Lands
CMA	Catholic Men Association
CFT	Confined Field Trial
CGIAR	Consultative Group for International Agricultural Research
EABL	East Africa Breweries Limited
EAML	East African Maltings Limited
INERA	Institut de l'Environnement et de Recherches Agricoles
FARA	Forum for Agricultural Research in Africa
GM	Genetically Modified
GEF	Global Environmental Facility
HEART	Health, Education, Agriculture, Research and Technology
IBERS	Institute of Biological, Environment and Rural Sciences
IRDP	Integrated Rural Development Program
IBSRAM	International Board for Soil Research and Management
ICIPE	International Center for Insect Physiology and Ecology
ICRAF	International Center for Research on Agro-forestry
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IFAD	International Fund for Agricultural Development
INDEPTH	International Network for the Demographic Evaluation of Populations and their Health in Developing Countries
KARI	Kenya Agricultural Research Institution
KEPHIS	Kenya Plant Health Inspectorate Service
LIFE	Living In Faith Everyday
MKEPP	Mount Kenya Economic Productivity Project
NAADS	National Agricultural Advisory Services
NARO	National Agricultural Research Organization
NBA	National Biosafety Authority
NaSAAR	National Semi-Arid Resources Research Institute
NGS	Next-generation Sequencing
PETOS	Provincial Agricultural Extension Officers
PDA	Provincial Directors of Agriculture
P4P	Purchase for Progress
RCUK	Research Councils UK
SCIFODE	Science Foundation for Livelihoods and Development
ISRA	Senegalese Institute for Agricultural Research
SEUCO	South Eastern University College
SDC	Swiss Development Corporation
TC	Tissue Culture
UNCCD	United Nations Convention to Combat Desertification
UNDP	United Nations Development Program
USDA	United States Department of Agriculture
WFP	World Food Program

Africa Harvest Program Assistant Ms Jane Ndiritu explaining the tissue culture banana technology to visitors during the 2010 Agricultural Society of Kenya (ASK) Nairobi International Trade Fair, October 2010

Africa Harvest
BIOTECH FOUNDATION INTERNATIONAL

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Africa free of hunger, poverty and malnutrition