

Facilitating Farmer-to-Farmer Learning and Innovation for Enhanced Food, Nutrition and Income Security in Kamuli District, Uganda

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Abstract

Achieving food and nutrition security among poor, vulnerable rural populations is a formidable challenge that requires innovative approaches. In Kamuli District, one of Uganda's poorest, a local non-government organization, Volunteer Efforts for Development Concerns (VEDCO), with its partners at Makerere University and Iowa State University, enhances local capabilities and assets through its work with farmer groups to foster sustainable improvements in food, nutrition and income security. During a five-year period, VEDCO trains and supports volunteer Rural Development Extensionists (RDEs) and Community Nutrition and Health Workers (CNHWs) who serve as learning catalysts for farmer group and community members. Participatory monitoring and evaluation of training and support for RDEs and CNHWs, and how they in turn train and support farm group and community members, contributes to continuous improvements that foster successful local adoption, adaptation and innovation. Discussion of lessons learned to date and ongoing programme innovations is intended to contribute to enhanced effectiveness among those engaged in rural extension and development.

Keywords: innovation, food security, nutrition security, livelihood security, volunteer trainer, agricultural extension

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1. MOTIVATION AND PROGRAMME FEATURES

Sub-Saharan Africa faces a formidable challenge of improving the livelihood conditions of its population (ADB 2002). One set of benchmarks against which current achievements are measured are the Millennium Development Goals (MDGs) which focus on, among others, halving extreme poverty and hunger by 2015 (FAO 2005). Recent reports indicate that although some countries have made significant progress in achieving the goals, much remains to be done, as the region still lags behind when compared to other parts of the world (WEF 2006). Uganda is one of the countries that has made progress on the poverty and food security dimensions of development (UNDP 2005).

Most of Uganda's population is rural based with over 80% dependent on agriculture and related activities for livelihoods (UBOS 2002). Recent research indicates reductions in agricultural productivity with negative impacts on food and nutrition security, household incomes and overall livelihood conditions (Nkonya et al. 2004). According to Bahiigwa (1999), Uganda's per capita food production in 1997 was 44 percent less than in 1970; growth in total food production (17 percent) was dwarfed by higher population growth (109 percent).

Underlying declining agricultural productivity is an array of interrelated factors. Key among them is land degradation that results from cultivation of fragile lands (steep slopes and swamps), continuous cultivation with limited use of organic and inorganic fertilizers, and limited investment in soil conservation (NEMA 2005). When land degradation is not addressed, the vicious cycle of land degradation (land degradation → declining productivity → poverty → further land degradation) prevails, putting affected communities in a complex downward spiral. Other major factors contributing to decreasing agricultural productivity include pests and diseases, vagaries of weather in a country where agriculture is almost entirely rain fed, limited use of improved production and post-harvest technologies (Pender et al. 2001), and inadequate access to extension services (Semana 2002).

Food insecurity leads to nutrition insecurity (malnutrition) because the amount and quality of nutrients required for effective body functioning is limited. Those most affected in developing countries are pregnant women and children under the age of five (FAO 2005). The prevalence of child malnutrition at household level in Uganda (39 percent of children below 5 years of age were stunted in 2000/2001) clearly shows that food and nutrition insecurity, as well as overall standards of living, are problems that require urgent attention (UBOS 2002).

Since the mid-1980s, as a result of improved peace and security, the government of Uganda has implemented programmes and policies aimed at ensuring economic growth and poverty reduction (APSEC 2000). Implementation of the Poverty Eradication Action Plan (PEAP), initiated in 1997, has contributed to significant reductions in poverty levels. The proportion of the population living in abject poverty in the country (less than 1 US\$ per day) declined from 56% in 1992 to 38% in 2004 (UNDP 2005). The Plan for Modernization of Agriculture (PMA), a key component of the PEAP, focuses on improving productivity of the agricultural sector and, thereby, improving food security and reducing poverty levels. However, much more remains to

be done to achieve sustainable development in rural Uganda (MAAIF/MFPED 2000). One of the approaches to enhancing sustainable development in Uganda is to invest in an appropriate mix of physical, human, natural, social and financial capital in rural areas, taking into account the diversity of situations (Sseguya et al. 2004). In this regard, a tripartite partnership programme was launched to contribute to improved livelihoods of communities in Kamuli District of east-central Uganda with a focus on asset building as a key component. In this paper, we share experiences and insights regarding one of the programme's key components - working with volunteer community members. We discuss how the process is initiated, facilitated and how the trainers adapt and innovate as they implement activities. Lessons learnt and implications for future and related interventions are presented.

Kamuli District in east-central Uganda is among the poorest in the country (UDS 2001). The district's land area of 3,332 km² is home to a population of 700,000 (51% female) (UBOS 2002). Rainfall patterns are bimodal (March-June and September-November), with an annual total of 135 cm; the monthly mean is 7.5-10cm (NEMA 1998). Located near the equator (1^o.20'N 33^o.20'E - 0^o56'N 33^o.05'E), the average altitude is 1,082m above sea level (NEMA 1997); annual temperatures are 19-25°C, with weather patterns in recent years being characterized by more severe dry seasons. The predominant vegetation cover is forest/savannah mosaic, consisting of a mixture of forest remnants and savannah trees with grass and shrubs. There has been a noticeable reduction in vegetation coverage during the past decade due to land clearing for cultivation and burning for charcoal production.

The government is the major provider of agricultural and rural development services, but coverage has been inadequate (KDAR 2003). This is due to reforms in the social service provision which were introduced in the 1990s, under the World Bank Structural Adjustment Programs. On extension services, Semana (2002:6) notes that "the reforms had a negative impact on the services... Down-sizing reduced staff in the field, and the districts lacked capacity to steer the extension role through staff development, support and reward. As a result, the staff lost morale and farmers' access to extension services reduced considerably. The flow of funding was also a problem." Efforts by non-governmental organizations (NGOs) are addressing some of the gaps.

One such effort is the partnership involving Iowa State University's Center for Sustainable Rural Livelihoods (CSRL), Volunteer Efforts for Development Concerns (VEDCO), and Makerere University (MU) (Butler & Mazur 2006). Implementation of the activities began in 2004 in four locations in Kamuli: Bwiiza and Namasagali parishes in Namasagali sub-county and Naluwoli and Butansi parishes in Butansi sub-county. In 2005, activities were expanded to include the parishes of Nawanende and Kasambira in Bugulumbya sub-county. The main objectives of the programme are to:

1. Promote farmer-to-farmer extension services and provide technical assistance in Kamuli district through training Rural Development Extensionists (RDEs), Community Nutrition and Health Workers (CNHWs), and farmers' groups for food security, nutrition, and enterprise development.
2. Promote viable agro-based enterprises among farmers' organizations to enhance commercial competitiveness of their produce, with special emphasis on women's participation for increased incomes.
3. Introduce value addition technologies among farmers, their groups, and marketing associations on a leasing or cost sharing basis to produce for the larger market.

4. Empower disadvantaged persons through specially designed programmes to enable them to improve their livelihoods.
5. Improve household nutrition and well being in Kamuli district through integration of nutrition and health into food security management activities.

The program works with communities through farmers' groups, both existing and new. These groups are encouraged to operate with an appropriate level of formal organization (constitution, elected leadership, etc.) and officially register with local administration. In addition to providing support in technical areas, the program enhances the capability of these farmer groups in terms of internal management techniques and competencies. This approach to working with groups rather than individual households is based on the assumption that group strengthening will increase the likelihood of achieving more sustainable development. The key element in this group approach is VEDCO's training of RDEs who, in turn, train members of the farmer groups in agricultural production, animal husbandry, and marketing. VEDCO also trains CNHWs who, in turn, train members of the broader community in aspects of diet, nutrition and health. VEDCO also works to strengthen the farmer groups to promote sustainability of innovations introduced.

2. FOOD, NUTRITION AND INCOME SECURITY

Nord et al. (2002:2) define food security as "access by all people, at all times (physically, socially and economically), to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life." It is noteworthy that recent definitions of the concept emphasize the need to exclusively focus on the issue of nutrition (Todd 2004). Whereas food security reflects adequate availability and accessibility to food, nutrition security connotes effective utilization, which encompasses dietary adequacy and balance (Kennedy & Bouis 1993). Thus, nutrition security refers to access to a nutritionally adequate diet. It also assumes that the food consumed is physiologically utilized to ensure that adequate performance is maintained in growth, resisting or recovering from disease, pregnancy, lactation and physical work (Smith et al. 2000). It takes into account sanitation, health services, and the knowledge and care needed to ensure good health.

Food and nutrition security are based on the key determinants: availability, accessibility and utilization. Availability of food refers to sufficient food (for all people) which can be achieved through production, storage or imports (Rosegrant et al. 2005). In contrast, accessibility can be achieved through control over and use of productive resources and purchasing power (Kennedy & Haddad 1992). Utilization, the ability to derive sufficient nutrition during a given period, is a function of cooking processes, feeding patterns, sanitation, and health status (Hamelin et al. 1999) and is closely linked to nutrition security. Nyariki and Wiggins (1997) also note that food and nutrition insecurity have a temporal dimension (short-term or chronic), and can be considered at the individual, household, community or national level. Availability tends to be a national issue, accessibility a community or household one, and utilization an individual component of the food and nutrition security concept.

With globalization of agro-food systems, food can be made available from anywhere in the world (McMichael 2002), but availability from outside the community may have undesirable impacts on community food access, as subsidized imports can potentially hamper local and national markets. Disparities in accessibility to resources make the poor more vulnerable to food and nutrition insecurity. Developing countries also have high levels of risk related to conflicts

and wars, unstable markets, breakdown of transport systems (Smith et al. 2000), as well as environmental crises like drought, plant and animal diseases, and polluted or contaminated end products (Gebremedhin 2000). Bohman et al. (1999) state that a focus on domestic production would help ensure the establishment of a safety net against these problems.

Income security refers to assurance, or at least a high degree of likelihood, of receiving income at an adequate level on a regular basis (all seasons and over a relatively long period), that is needed to pay for basic life necessities. The concept is closely related to healthy economies, which Flora (2006) characterizes as being appropriately diverse, efficient and able to contribute to increased assets among community members. Marketing of agricultural produce has not generated sufficient incomes for small scale farmers in developing countries, in significant part because of privatization, liberalization, and an international market 'playing field' that is distinctly 'unleveled' because of production and marketing subsidies in developed countries (Kindness & Gordon 2001). Thus, in a situation where existing means of earning income are not effective or diversified, local economies are deemed insecure, with community members likely affected by continuous or worsening poverty. Interventions to help assuage the situation are necessary if livelihood improvements are to be achieved.

At the launch of the CSRL/VEDCO/MU livelihood improvement programme in September 2004, a community baseline on food, nutrition and income status was conducted (Sseguya & Masinde 2005). The approach employed participatory tools whereby community members developed indicators for each of the three themes. On food and nutrition security, indicators refer to how much food is available for a household, number of meals eaten daily, diet diversity and general appearance of individuals (Table 1). Seasonal calendars of food availability were also generated.

Results indicated that only 9% of the households were considered to be food secure, 46% food insecure and 45% extremely food insecure; nutrition security status was 10% good, 52% ordinary, and 38% poor. On food availability, there were months of food abundance (especially July and August) and scarcity (March and April). During the latter, community members coped by buying, borrowing or reducing the number of meals eaten. For income security, minimal opportunities apart from farming were reported in all communities. Wealth ranking of communities also revealed that most households were perceived to be either poor (47%) or extremely poor (42%). Based on the baseline results, the programme embarked on priority interventions for improvement of livelihood status.

3. COMMUNITY VOLUNTEER TRAINERS AS PART OF THE LIVELIHOOD IMPROVEMENT PROGRAMME

Farmer-to-farmer training and extension is a key component of the food security and nutrition components of the programme. Volunteers, selected by community members, are trained by VEDCO staff to eventually serve as trainers of fellow farmer group members. Two types of volunteers are involved: Rural Development Extensionists (RDEs), responsible for food security issues, and Community Nutrition and Health Workers (CNHWs) who are responsible for nutrition and health issues. Selection of the volunteers is based on a number of individual qualities, notably hard work, approachability and residence in the area. Educational qualifications are also considered by the programme - the candidate must be able to read and write, such that he/she can ably record the proceedings of the training by VEDCO staff, and

write reports on his/her work, which are submitted on a monthly basis to the VEDCO field office. On average, the education attainment of RDEs is 9 years of school (9.6 for males and 8 for females), the lowest level for males being 6 years and for females being 5 years. For CNHWs, the average educational attainment is 8 years (9 for males and 7 for females), with the lowest being 8 years for males and 4 years for females.

Trainees are exposed to the theory behind the subject, followed by 'hands on' practical training in application of the concepts. The training mostly takes place in the community and a variety of approaches are used - lectures, group-based activities, demonstrations, and experiential techniques. Exposure visits to other groups and communities are organized to enhance learning.

The duration of the training is approximately three years for the complete curriculum. For RDEs, curriculum in the first year includes farmer-to-farmer extension, communication skills, group dynamics and leadership, low external input sustainable agriculture, soil and water conservation, farm planning and layout and farm records and accounts. In the second year, key concepts are issues relating to group dynamics, leadership, and gender and development, in addition to natural resource management, animal draught power, and nutrition and health. In the third year, post-harvest management, livestock production, animal health and diseases and farm business education are covered. It should be noted that this content is flexible and can be adapted according to community needs and level of development.

Adaptation of content also applies to CNHWs but, in general, the first training year includes group dynamics and leadership, food nutrients and their sources, nutrition, planning an adequate diet, malnutrition, and community nutrition and health extension. In the second year, content covered includes hygiene and sanitation in the home, assessing nutritional status, effects of infections/diseases, alcohol/drugs on nutrient digestion, and effects of inadequate nutrient intake. The third year curriculum includes nutrition and HIV/AIDS, nutrition management of HIV/AIDS related complications, and nutrition for children and pregnant mothers. This curriculum, for both RDEs and CNHWs, is reviewed both within the organization and with community members.

By the end of their first year as trainees, RDEs and CNHWs begin teaching their farmer group and community members through group sessions, demonstrations, and home visits. Demonstration gardens are established at the homes of RDEs and CNHWs or at alternative agreed-upon sites. The crops and animals established through these demonstration sites reflect the major enterprises implemented by participating community members. Their management is designed to be a responsibility of group members served by trainees. To this end, a Memorandum of Understanding is established and signed between each group and VEDCO. The programme currently has 51 RDEs (41% females) and 25 CNHWs (76% females) in Kamuli. The average age of RDEs is 45 for males (range 28-65 years) and 41 for females (range 24 – 65 years). CNHWs have an average age of 39 for males (range 26-62) and 43 for females (range 29-65 years). The programme works with 70 farmers' groups having 1430 members (1044 females and 386 males).

Trainees schedule fortnightly meetings with community members. To facilitate their activities, RDEs and CNHWs are provided with kits (a wheelbarrow, bicycle, gumboots and watering can for both; a measuring scale and tape are additionally given to CNHWs). Volunteers are also provided with training materials like posters, chalk boards, and brochures. In the first two years of programme activities, we have observed some adaptations and innovations in the farmer-to-farmer learning and training approach in pursuit of livelihoods goals.

4. ADAPTATIONS AND INNOVATIONS IN VOLUNTEER TRAINERS' APPROACHES

The adaptations and innovations that have occurred in the programme can be characterized as being both organizational and farmer-to-farmer learner centered. At the organizational level, during the early stages of the programme, training sessions were residential, based in Kamuli town. Through our experiences, we realized a threat of some members forbidding their spouses from attending sessions conducted away from the community. This arrangement proved problematic for some women because it was difficult for them to be away from their homes and families for long periods of time, compounded by their spouses' disapproval of residing in 'lodging' (hotels) alone. The organizers adapted to the challenge by holding non-residential training sessions in local schools, churches and sub-county headquarters. This change has considerably increased attendance of both male and female RDEs and CNHWs.

Modifications were also effected in the training materials to enhance learning. This was done by utilizing local or health-related examples to increase understanding of complex subjects and issues. For instance, in explaining the need to thin crops to achieve appropriate spacing and good yields, we relate the idea of raising good and healthy plants through thinning to a mother who produces so many children who are closely spaced compared to one who produces well-spaced children. Another change has been to produce training materials in local languages to increase understanding.

Local management of demonstration and multiplication sites for improved planting materials, key components in training, is reinforced by guidance from VEDCO staff when requested and when needed; this is an innovation itself. Although we have not to date deliberately documented management lessons from farmers as managers of these demonstrations, we believe that there are important lessons to be learnt from this arrangement. Another adaptation in management of the demonstration units is aimed at enhancing efficiency. In the past, we have been accessing all improved planting materials from their original sources (Kawanda Agricultural Research Institute - KARI, Namulonge Agricultural and Animal Production Research Institute - NAARI, or Victoria Seeds). Since most of these materials are open pollinated or are planted from cuttings, we recently devised a means of accessing bulk supplies from the input supplier, establish one large multiplication centre, and then establish smaller centres and more demonstration units from the harvest of these materials.

Farmers' adaptations and innovations in their approaches are also enlightening, as they reflect increasing empowerment. In the beginning, they could not challenge program schedules or timelines suggested by VEDCO. One key indicator of empowerment is when a community-based organization is sufficiently self-confident to say 'no' to organizations or activities that do not meet their own criteria for development (Mazur and Masinde 2005). For instance, they initially adhered to the fortnightly training schedule, but later realized that flexibility is necessary. Thus, the frequency of training now varies, depending on the season. Immediately before the land preparation period, RDEs conduct more training sessions than during planting periods because the demand for knowledge and skills just before the planting period is higher and farmers tend to be less busy.

Another innovation by RDEs/CNHWs is in the area of combining training and asset enhancement. They loan trainees planting materials from their own gardens as a way of ensuring retention. This way, they have been able to maintain interest and encourage increased adoption of technologies. A few examples will illustrate this experience.

Johnson, an RDE in Butansi Parish, has mobilized his group members to make monthly contributions. They save and purchase planting materials during the harvest period, which they preserve and store. During planting time, the materials are sold to members at below market rates to ensure that they have good seed. Those who cannot afford to make these purchases receive loans in the form of planting materials which they pay back at harvest time. Johnson's group plans to utilize the savings to start other income generating activities for individual members. All these are linked to training by the RDE. Johnson ensures that the trainees are implementing what they learn in the training. His approach focuses on enhancing access to financial capital while enhancing human capital among trainees.

Jane is a CNHW in Naluwoli Parish. She received 5kg of improved bean seed from VEDCO that she paid back at harvest time. She then proceeded to give 2kg of the seed to her group members as a loan. Members are expected to pay back the 2kg at harvest time. Like Johnson, Jane ensures that trainees can implement properly what they learn as they enhance their livelihoods.

Rose schedules the planting of her cassava to be ready for harvest during the food scarcity period. She then sells her crop at a better price. Since many community members visit her to purchase the cassava crop, she makes the sales contingent on being able to teach buyers better agricultural methods and sells them improved planting materials at a below market price as an incentive to plant their own crop. Through this arrangement, Rose is also able to reach more people beyond her immediate group members.

5. LESSON LEARNT AND IMPLICATIONS

In our program approach and activities, we have adapted and innovated in response to ongoing community-based participatory monitoring and evaluation and through periodic review and planning workshops among staff. A series of changes has recently been initiated to increase effectiveness and sustainability of program interventions and to increase efficiency in use of key resources, particularly staff time and energy.

The most significant change is to conduct the selection of RDEs at the end of the first year of operation with farmer groups and communities, rather than early in the 'engagement' process with farmer groups. The multiplication gardens will be much larger than in the past, so that they can provide enough planting materials for members of the farmers group. Establishing multiplication gardens within the communities will reduce the cost of transporting certified planting materials from Kawanda, Namulonge, etc. Moreover, setting up multiplication gardens at the onset and in this manner has several additional advantages: allowing more time to interact with group members and the wider community, increasing the community's understanding of the program, being in a better position to verify the competence and dedication of the people nominated by groups and communities for training as RDEs and CNHWs, fostering practical learning about seed breeding, maintaining seed diversity, sharing resources within the community, establishing new crops in the community, and building skills and social capital at the

group and community levels. Improving group dynamics and strengthening group capabilities are increasingly recognized as continuous processes, ones that are essential to assuring sustainability. To better support those efforts, future baseline surveys will be modified to more fully understand the capabilities that exist at the group and community levels.

As they attempt to address the complex issues of livelihoods, RDEs and CNHWs have also adapted and innovated in the practical application of methods and techniques, and in their training and assistance approaches. To capture the interest and attention of their trainees – and the wider population, RDEs and CNHWs have devised methods that integrate training into commercial sales. They develop methods that contribute to asset accumulation and address limitations caused by lack of access to capitals that inhibit development of sustainable livelihoods.

Among the principal challenges now being faced in relation to rural development support efforts based on work with volunteer RDEs and CNHWs are the following:

- determining appropriate literacy levels in relation to training and expected work
- identifying the source of slow adoption and adaptation rates among some farmer group members, considering variation in characteristics and behavior of both farmers and RDEs
- fully understanding the factors that cause some either to drop out or to ‘graduate’ (moving from the program of one NGO to another or reducing one’s commitment as she/he becomes increasingly successful in production and marketing)
- documenting successful cases, approaches and creative solutions to problems encountered

Table 1 Criteria for food and nutrition security rating, Kamuli District, Bugabula County

Food secure household	Food insecure household	Extremely food insecure household
<ul style="list-style-type: none"> • Full granary or store of food • Eat four times a day • Eat a variety of foods • Rarely fall sick • Possess cultivated land with a variety of crops • Have bright children • Are energetic • Happy most of the time 	<ul style="list-style-type: none"> • Half-full granary or store of food • Eat two times a day • Occasionally eat a variety of foods • Occasionally fall sick • Buy food at times • Fairly healthy appearance • Pale looking children 	<ul style="list-style-type: none"> • No granary or store of food • Eat once a day • Do not change foods eaten at home • Work for food from other community members • Usually appear sickly • Children usually eat from the neighbors' homes • Malnourished and stunted children • Husband and wife always absent from home • Sad most of the time

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