Research Application Summary

University outreach support to farmer associations in Western Kenya: The case of The RUFORUM's Community Action Research Project (CARP) at Moi University

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Abstract

Moi University's School of Agriculture obtained a research grant from the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) under the Community Action Research Program (CARP) to carry out a research leading to the strengthening of the linkages between the universities and farmer associations. This is part of an endeavor to promote agricultural production in western Kenya. The Project linked with three Farmer Associations (FAs) in western Kenya in developing research programs and for disseminations of research findings. Field demonstrations were setup to refine and adapt new high yielding production technologies. The Project has enabled FAs develop their business plans, initiate contract farming to produce *striga* tolerant seed maize, increased sorghum production, improved management of FAs and built the capacity of FAs to undertake value addition. Three machines have been purchased for each for the three FAs to undertake value addition leading to marketing of finished pure or fortified soyabean and groundnut products. The project activities has brought FAs to a stage towards self sustainability and income generation.

Key words: Farmers associations, markets, Universities, value addition

Résumé

L'Institut d'Agriculture de l'Université Moi a obtenu une subvention de recherche du Forum Régional des Universités pour le Renforcement des Capacités en Agriculture (RUFORUM) dans le cadre du Programme de Recherche-Action Communautaire (CARP) afin de procéder à une recherche qui conduit au renforcement des liens entre les universités et les associations d'agriculteurs. Cela fait partie d'une initiative pour promouvoir la production agricole à l'Ouest du Kenya. Le projet s'est connecté à trois associations

d'agriculteurs (FAs) à l'ouest du Kenya dans le développement des programmes de recherche et pour la vulgarisation des résultats de recherche. Les démonstrations sur terrain ont été installées pour affiner et adapter de nouvelles technologies de production à haut rendement. Le projet a permis aux associations paysannes de développer leurs plans d'activités, de lancer l'agriculture sous contrat pour produire des semences de maïs tolérant au striga, la production accrue de sorgho, une meilleure gestion des FAs et le renforcement des capacités des FAs afin de procéder à l'ajout de valeur. Trois machines ont été achetées pour chacune de trois associations FAs pour procéder à l'ajout de valeur conduisant à la commercialisation des produits finis purs ou enrichis du soja et ceux d'arachides. Les activités du projet ont amené les FAs à une étape d'autosuffisance et de génération des revenus.

Mots clés: Associations d'agriculteurs, marchés, Universités, ajout de valeur

Background

Moi University's School of Agriculture obtained a research grant from the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) under the Community Action Research Program (CARP) to carry out a research leading to the strengthening of the linkages between the universities and farmer associations in an endeavor to promote agricultural production in western Kenya. The Project was implemented with the realization that over the years, most of these farmer organizations in western Kenya had collapsed yet new once have continued to be formed. The farmer associations (FAs) have a high potential to provide diverse agricultural services to the agricultural producers who lack the technical capacity to implement the change that is required to transform their agricultural sector or lack the critical volumes of agricultural activities necessary to benefit from the economies of scale that would make agricultural production economically viable.

The public sector participation in the agricultural sector development have been decreasing even though the structural adjustment programs implemented in the 1990s had envisaged the situation that the private sector would substitute the public sector in provision of services to the farmers through a demand driven market mechanism. The profit motive and the riskiness of the agricultural enterprises in the setup evident in western Kenya led to just a few investors in the agricultural service sector. The role of the public institution with the responsibility

of developing the sector has also been limited by the low resource available to them. One of such institutions are the Universities who undertake diverse research. Traditionally, there has been no link between universities and the farmers and farmers have considered universities as beyond their reach. The present research aims at developing a strong relationship between the Faculty of Agriculture at Moi University and its clients, the farmers. The specific objectives of the project are:

(1) To examine the operations and needs of three contrasting farmer associations (FAs) and explore the opportunities to expand information and marketing services to their members and with other service organizations.

(2) To identify mechanisms that permit FAs to expand services expected by members and operate in a self-sufficient manner based upon revenues from membership dues, community fundraising and brokerage fees.

(3) To assist FAs and their members to improve their problem identification and solving skills and develop mechanisms for farmer-to-farmer extension actions.

(4) To build advanced capacity in the operations of the FAs at the M. Sc. and Ph. D levels and to better orient researchers and development specialists toward FAs.

Literature Summary

Sub-Saharan Africa (SSA) region continues to experience perennial food shortages and widespread poverty (FAO, 1996). In this region, the agricultural sector is expected to provide solutions towards food security, but bottlenecks hinder the intentions and practices of this sector. To give a few examples, first, the bulk of soils in SSA, Kenya included, are highly weathered, acidic and nutrient depleted, whereby the major nutrients, nitrogen and phosphorus are commonly deficient (Woomer and Muhena, 1996; Bationo *et al*., 2006; Okalebo, 2009). Thus these infertile soils are mainly account for low crop yields, e.g. below 1 ton/ha of maize per season in western Kenya (Nekesa, 2007). Secondly, most smallholder farmers have difficulties to access credit to purchase the highly priced inputs (quality seed, fertilizers, pesticides and fungicides). Often there are delays on importation and delivery of inputs. Nonetheless, the prices of on-farm produce are generally low and unstable (Wanyama *et al.*, 2006; Odendo *et al.*, 2011). This makes farming unattractive. In terms of marketing, there

are emerging efforts to train farmers to add value to their products and also for collective marketing. In terms of food sufficiency and income generation, in the 1960s to 1980s (post independence period in SSA), strong and efficient farmers' cooperatives/associations existed (Woomer *et al*., 2003). At their early stages of formation, these farmers' organisations assisted their members to import and distribute inputs and sales of produce, among other benefits. However, most of the post independence farmer associations collapsed and left farmers to exploitative tendencies of the private sector making agriculture seem unproductive.

Universities have continued to generate information that can aid farmer associations in promoting members' productivity and profitability in farming enterprises. There are effective technologies that can raise the maize (staple) yield from below 1 ton/ha to 5 t/ha at smallholder farm level (Nekesa, 2007). Such technologies are documented, such as the "MBILI" (staggered maize and legume intercropping arrangement), use of fortified compost, use of striga weed tolerant maize varieties, liming acid soils, among others. A key aim of this project is therefore to promote the use of these technologies, through working together with FAs. The CARP Project aim at developing models for sustainable management of farmer association to improve operation efficiency, enhance technologies adoption and increase marketed volumes and margins. Farmer associations are important in agricultural development because they are critical in mobilizing their members to engage in markets (Shiferaw *et al.*, 2006) by delivering market information, coordinating marketing functions and ensuring smallholder competitiveness in markets (World Bank, 2002).

In order to off-load the technologies in the universities shelves, the FAs offer entry point to enable the interaction between the University and the community. The interaction will improve effectiveness of research, equity and build social and human capital with spillover effects (CIAT, 2004). The link with the university ensure that farmers benefit from joining FAs through timely sales of their farm produce, access to trainings on good agricultural practices and farm management and loans which they otherwise have no access to individuals (Grigoryan *et al.*, 2008). Indeed, in SSA agricultural research and advisory services are increasingly channeled through farmers' associations (Wennink and Heemskerk, 2006).

Study Description

Farmers are rational economic players and join FAs in order to improve their farming profits. The project adopted a holistic strategy to improve the performance of the Farmer associations through increasing the range of services FAs offers to their members, improve their management structure and develop effective marketing strategies for products. After the inception workshop in March 2010, field trials were set up to disseminate information on the following proven technologies; production and use of fortified compost at the rate of 2 tons/ha (Ndung'u *et al.*, 2003), MBILI Push-Pull with Ua Kayongo maize (Woomer *et al*., 2005), Lablab relay fallow (Mureithi *et al*., 2002) Super2 Intercropping Package, Improved legume varieties (Kelly *et al.*, 2003), Maize and grain legume processing tools (Woomer and Mukhwana, 2004). Apart from the field demonstrations, other information dissemination strategies were used to disseminate information on these technologies such as farmer field school, common interest group approaches, training and visits and development of information packages. The experiments were set up in farmers fields and farmers invited for demonstrations.

Socio-economic data were collected through administration of a questionnaire to a sample of 223 households. The sampled households were distributed as 132 from the three farmer association, namely, Mwangaza farmers group (MFAGRO) in Vihiga, Bungoma small scale farmers organization (BUSSFO) in Bungoma and Angurai farmers development project (AFDEP) in Teso, and 89 farmers who were not affiliated to any of the farmer associations. The sampled households were randomly selected using the multi-stage sampling procedure to select the sampling area and systematic random sampling procedure to select the households from the sampled areas. Farmer Associations management data was obtained through focused group discussions and interviews of FAs management.

The CARP Project linked with a leading NGO based in Busia Kenya, Appropriate Rural Development Agriculture Programme (ARDAP) for monitoring and evaluation of Project activities and in providing leadership in development of business plans in the FAs. Capacity building for the community and the leaders of FAs was done jointly by the University and the NGO. The objective of the development of business plans and capacity building was to enable FAs operate at economically sustainable levels and ensure farmers obtain economic benefits after joining the FAs. Profitability of the marketing function of the FAs was

critical for providing resources for other services by FAs and providing motivation to farmers in form of additional revenues from their produce in order to enhance crop production.

For economic sustainability of FAs, microeconomic theory provides that firms should produce at the points where marginal cost (MC) and the marginal revenue (MR) are equal and that the MC curve should be rising. But even before maximizing the profit, FAs should aim at meeting their costs of operation. At the breakeven point, cost or expenses for undertaking value addition and revenues from selling the products developed are equal (there is no net loss or gain). The breakeven point (in terms of Unit Sales of product, X) can be directly computed as based on expected Total Revenue (*TR*) and Total Costs (*TC*) as:

At break even, *TR*=TC but *TR* = Price (P) x Quantity sold (*X*)
$P \times X = TFC + VC$, Where *TFC* = total fixed cost and *VC* is the total variable cost.

Total variable cost is computed as unit cost $(V) \times X$
Thus, $P \times X = TFC + V \times X$
(P x X)-(V x X) = TFC

$$X = \frac{TFC}{P - V}$$

The quantity (P-V) is the unit contribution margin for each product, i.e., the portion of each sale that contributes to Fixed Costs. The break-even point can be more simply computed as the point where Total Contribution = Total Fixed Cost.

Research Application

Figure 1 show the operational tripartite linkages between the University's CARP Project, the students and the FAs. The FAs have prioritized different products to target for value addition as AFDEP, groundnuts, BUSSFO and MFAGRO soyabeans. The linkage with FAs has enable the CARP Project to directly reach 2516 farmers through extension, demonstrations and training with an expected multiplier effects in the outcomes of training. The products developed in the value addition component will reach an estimated 1,200 soyabean producers affiliated to the FAs through increase in price they obtain for their produce. Initially, the FAs has offered 16% higher price to its members for the produce delivered for processing in the FAs.

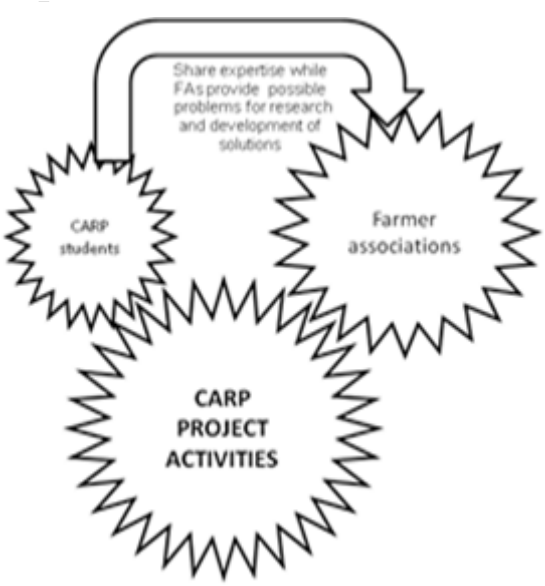

Figure 1. Tripatite linkage between theCARP Project, the Farmer Associations and the Students.

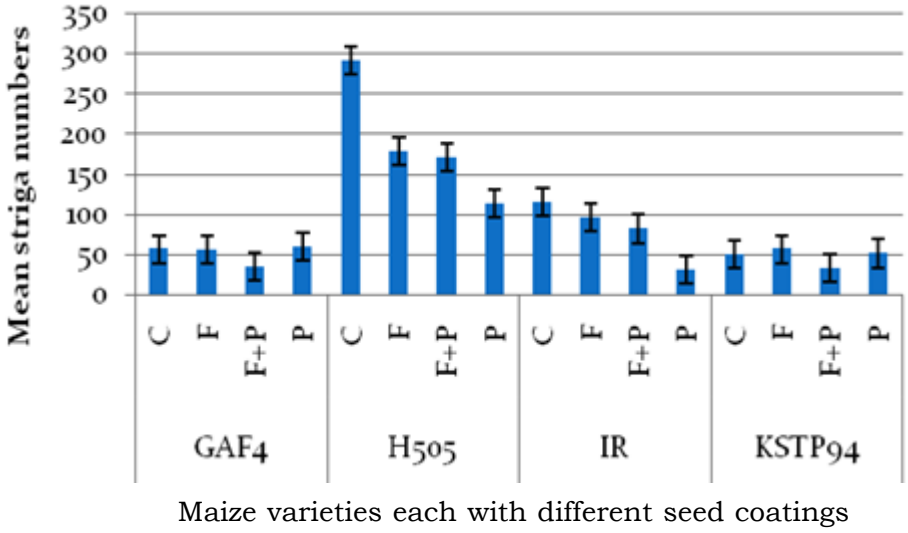

Figure 2. Mean striga infestation levels of different maize varieties treated with different seed coating F (*Fusarium oxysporum f.sp strigae* (Foxy FK3)), P (soluble Phosphorus) and F+P compared to control (C).

The Project has established the possibility of coating seed maize with a fungus, *Fusarium oxysporum f.sp strigae* (Foxy FK3), a soluble Phosphorus based fertilizer (Gro-plus) or a combination of the two for the control of striga. The Project has developed a 1-ha seed maize plot that is expected to generate adequate seed for maize farmers who have reported *striga* in their farms. Figure 2 show the performace of the treatments in

controlling *striga*. The treatments achieve up to 83% reduction. Results have shown that *striga* infestation is also variety dependant and thus, GAF4 maize variety was used in establishing of the seed maize. The project is linking with the Kenya Plant Health Inspectorate Service (KEPHIS) for the certification of the seed maize.

Taking into consideration the cost of raw materials, value addition and marketing by the farmer groups, the Project established the break-even prices as shown in Table 1. The FAs will be expected to sell at least 320 packets of 2 kg each distributed equally among the products i.e. 45 for each of the products developed to breakeven. It is imperative that in order to increase sales and profits, the farmer associations will need to further reduce the costs of operations so as to be able to provide the product with an economically viable lower prices.

Table 1. Products developed by the farmer associations with the support of the CARP Project.

Mix	Trade name	Unit cost/ 2 kg pack	Selling price
Pure soya	Westernsoya,	80	112
Grain Amaranth	Babysoya, babymix, babypower	240	240
Grain amaranth + finger millet	Nutrimix , AFDEMIX	170	190
Grain amaranth + finger millet + Cassava	Ujipower	170	210
Grain amaranth + maize	Bussfomix, MFAMIX,	165	170
Grain amaranth + Cassava	Soyamix, Tesomix, Tesouji	175	170
Grain amaranth + maize (major maize)	CARP power, CARP Ugali	140	160
Pure maize	Western Unga, AFDEP Unga, MFAGRO Unga, BUSSFO Unga	95	110

In general, the Project has enabled FAs develop their business plans, initiate contract farming to produce *striga* tolerant seed maize engage in sorghum production, catalysed efficient management of FAs and built the capacity of FAs to undertake value addition. Three machines have been purchased for the three FAs to undertake value addition leading to marketing of finished pure or fortified soyabean and groundnut products. FAs have been exposed to the on-going profitable cottage industries in various areas of west Kenya, such as milk processing for both fresh and popular sour soya milk; repackaging of hulled and ground maize flour, soybean milk production and groundnut processing for butter.

Acknowledgement

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Plate 1. Some of the products developed by the CARP Project.

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