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Research Application Summary

University outreach support to farmer associations in western Kenya

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Abstract

Moi University's School of Agriculture obtained a research grant from Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) to carry out a research leading to the strengthening of the linkages between Moi University and farmer associations in an endeavor to promote agricultural production in western Kenya. Through the grant, field trials will be set up to adapt some proven technologies in order to promote adoption by farmers. Socio-economic data will be collected through administration of questionnaires and participatory rural appraisals with farmers and staff of farmers associations. Linear programmes will be used to assess the multiple tasks and objectives of farmer association. Socio-metric analysis will be used to assess the power and social ties in the farmer associations and faming communities. The models developed in this study will provide a strategy to expand the range of services offered and profitability of farmer associations, establish efficient operation structure of farmer associations and improve farmer-farmer associations-universities linkages.

Key words: Farmer organisation, Moi University, western Kenya

Résumé

La Faculté d'Agriculture de l'université Moi a obtenu une subvention de recherche des universités du Forum régional de renforcement des capacités dans l'agriculture (RUFORUM) pour effectuer une recherche de pointe au renforcement des liens entre l'Université Moi et les associations d'agriculteurs dans un effort de promouvoir la production agricole dans l'ouest du Kenya. Grâce à la subvention, les essais sur le terrain seront mis en place pour adapter certaines technologies éprouvées afin de promouvoir l'adoption par les agriculteurs. Les données socio-économiques seront collectées par l'administration des questionnaires et des évaluations rurales participatives avec les agriculteurs et le personnel des associations d'agriculteurs. Des programmes linéaires seront utilisés pour évaluer les multiples tâches et les objectifs de l'association des agriculteurs. L'analyse sociométrique sera utilisée pour évaluer le pouvoir

et les liens sociaux dans les associations d'agriculteurs et les communautés des fermiers. Les modèles développés dans cette étude fourniront une stratégie visant à élargir la gamme des services offerts et la rentabilité des associations d'agriculteurs, d'établir une structure de coopération efficace des associations d'agriculteurs et d'améliorer les liens entre les agriculteurs et les associations d'agriculteurs et les universités.

Mots clés: Organisation paysanne, l'Université Moi, l'ouest du Kenya

Background

An important component of the development strategies of newly-independent African nations during the 1960s and 1970s was the establishment of agricultural cooperatives. These organizations were designed to provide diverse agricultural services to the agricultural producers who were deemed to be the main drivers in the economies. However, over time most of these farmer organizations collapsed because of political pressures and influences that did little to promote the welfare of small-scale farmers. The collapse of the associations bred strong distrust of government-controlled cooperatives among small-scale farmers. The wave of the Structural Adjustment Programmes (SAPs) in the 1990s saw the phasing out or privatization of monopolistic cooperatives while the subsidy programs were discontinued. Although the SAPs had envisaged a situation where upon the disbandment of public institutions the private sector and small-scale enterprise would quickly step-in to provide agricultural services in an economically efficient manner, the profit motive of the private sector led to too few investors and entrepreneurs filling the vacuum to provide agricultural services. The demand for the farmer association is evident with the number of farmer associations that are registered on daily basis.

A type of farmer association common in western Kenya is where neighbouring farmers sharing common obstacles and opportunities organize themselves for collective action. They devote their resources to accessing information, learning new technologies and pooling resources to acquire inputs or to market surpluses. A quick look at the farmer associations reveals problems of the associations in forming legally binding self-help groups and lack of general management skills. Technology development and adaptation skills are virtually absent in such organizations an if there are any, it is an *ad hoc* process. On

the other hand, Universities have continued to generate information that can aid farmer associations in promoting members' productivity and profitability in farming enterprises.

The questions that need to be answered include, and not limited to, what model should be followed for sustainability management of farmer association? How can farmer associations' efficiency be improve? How can we use farmer associations to enhance technologies adoption? What is an efficient produce marketing chain? How do we improve accessibility of farming inputs?

Literature Summary

Most of the African countries identified agricultural cooperatives as institutions for input distribution, output marketing, and information dissemination. The institutions performed relatively well through promoting export of agricultural commodities such as coffee and tea but were found wanting in promoting the welfare of small-scale farmers (Eicher, 1999). Structural adjustments introduced during the 1980s and 1990s led to the disbandment and/or privatization of the government supported cooperatives (IFDC, 2003; Smaling *et al.*, 2006) leading to the reliance of the cooperative formed and managed by the private sector. The private sector cooperatives operate typically under conditions of low resource base, lack of expertise, low profitability, poor management and inconsistency. A large number of farmer self-help groups are emerging in Africa (Woomer *et al.*, 2003), primarily to better access information and learn low-cost technologies. More recently, these grassroots organizations are consolidating into wider umbrella organizations in order to broaden the scope of their services. Stringfellow *et al.* (1997) recognize this kind of development as positive, but caution donors and development organizations from overburdening these newly-formed organizations with too complex or too many tasks.

Technologies play an important role in improving performance of farmer associations. The management structure and the interrelationships in the management influence technology adoption in the association. Innovations are referred to as process and product innovation. Process innovations are important for the operations of farmer associations. Rogers (1983) showed that farmers make rational decisions taking into account their environment. The assertion by Rogers mean that farmers adopt technologies following some order and would depend on adoption stimulus available. The ability of farmer cooperatives to provide such stimulus depends on their economic power and

their ability to collate and disseminate information or agricultural technologies.

Study Description

Farmer associations operate in a multi-task-multi-objective dimension. The basic model developed should be capable to take into consideration all the possible task that a farmer association can undertake, analyze the resources that may be required and show how management decisions would affect the organizational outcome. The linear programming models are capable of analyzing many technologies for example, the chac model.

The basic model that will be used in this study will be of the following general form:

Max {set of farmer associationobjectives, farmer objectives}
Subject to

$$x_i \leq 0$$
$$x_j \leq 0$$ for all *i* farmer association resources and *j* farmer resources
$$x_i, x_j > 0$$

Field trials will be 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). Different information dissemination strategies will be used to disseminate information on these technologies such as farmer field schools, common interest group approaches, training and visits, on-farm trials and development of information packages (e.g. bronchures). Field experiments will be set up in three farmers' fields in a complete random design with three replicates. Data will be collected to assess the potential for adoption of the technologies by the farmers. The influence of the institutional set up and the power structure will be analyzed by assessing the sociometric status in the farmer associations and among farming communities.

There are specific networks such as kinship, religious grouping, friendship and financial relations that can be exploited as a channel for technology adoption/diffusion. The organization

places participants in different hierarchy of the society that influence their ability to influence decision making including that of purchase or use of a new technology. The centrality index of closeness reflects the reachability and power position of a person. Farmers with high closeness are well connected within the network and can react swiftly to changes in the network because they are closest to all other farmers. Because of this, they can move information more quickly through a network as they will require few intermediaries to accomplish the task. This structural advantage can be translated into power to influence others. Closeness is defined as the inverse of the sum of the geodesic distances (farmer-farmer) from one node (farmer) to all the other nodes (farmers). The basic models used in analyzing the social networks for studying information flow are given below. The geodesic distance between two given nodes is the shortest possible path between them. The length of a path is the number of links that comprise that path. The following models will be used; Closeness= $\frac{1}{\sum_{j=1}^{g} \delta_{ij}}$ where g is the size of the farmer network within the association, ä is the geodesic distance from node *i* to node *j*. The sociometric status is the sum of its emission and reception degrees relative to the number of all other nodes in that network.

Emission degree = $\sum_{j=1}^{g} x_{ij}$ Reception degree = $\sum_{j=1}^{g} x_{ji}$

Sociometric status= $\frac{1}{g-1}\sum_{j=1}^{g}(x_{ij} + x_{ji})$ Where *i* is the index of the current node, x_{ij} are the link values from node *i* to node *j*, x_{ji} are the link values from node *j* to node *i*, and *g* is the total number of nodes in the network.

Soil samples will be collected before setting up field trials and analyzed to determine nitrogen, phosphorous, sulphur and potassium levels. These nutrients generally occur in low levels and limit productivity. Agro-economic data will be collected through sampling of plots during vegetative and maturity growth stage of crops to assess their biomass yield. Socio-economic data will be collected through administration of questionnaires and participatory rural appraisals with farmers and staff of farmers associations.

Research Application

This project is expected to start in September 2010. The models developed and results of the analysis of operations of farmer associations will help in (i) providing a strategy to expand the range of services offered and profitability of farmer associations; (ii) establish efficient operation structure of farmer associations; and (iii) improve farmer-farmer associations-universities linkages. Other key project outputs will include one Ph.D. and four M.Sc. students trained with expertise in working with farmer associations who will graduate from Moi University and enter the agricultural workforce. A minimum of six publications will be published in refereed journals from studies carried out by this Project. In addition, Farmer outreach activities will engage 1080 households over three years leading to the direct establishment of 108 ha of improved cropping, deploying 4.32 tons of improved crop seed and 16.2 tons of fertilizer. This will lead to the production of 346 tons of additional grain valued at $110,592.

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