Economic and Social Impacts of the Common Interest Group Approach to Public Agricultural Extension in Kenya

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This research examined the economic and social impacts of the common interest group approach to public agricultural extension in Kenya. The research utilized cross-sectional household data collected in February 2006 for an internal impact assessment at the end of phase one of the National Agricultural and Livestock Extension program which was implemented from 2000 to 2005. The major sources of parameter bias were controlled by employing a double difference estimator to control for farmer selection bias and geographical dummy variables to control for biases related to fixed locality characteristics.

The common interest group approach had a significant impact on farmers' access to extension services but no significant impact on farmers' access to agricultural credit and marketing. In addition, the approach had a significant impact on the agricultural productivity of group members. When the impact on productivity was disaggregated in accordance with marginalized social categories, a significant impact was found on uneducated farmers and those with more than six children but not on female heads of households. The approach also had a significant positive impact on the quality of life of farmers' wives.

Some recommendations were made to improve the effectiveness of the common interest approach. To improve farmer's access to markets and credit, common interest groups should be facilitated to form associations of groups to benefit members by improving their knowledge, economies of scale, and bargaining power. Further group training in the areas of financial and business management, as well as in production and marketing systems, should be facilitated. In addition, promotion of agro-processing technology is necessary to enhance primary agro-processing and to provide new market opportunities. Finally, groups should be linked with the private sector to increase access to market information, technology, and new market opportunities.

To ensure that female-headed households benefit equally with others from the approach, extension activities could be scheduled and timed with sensitivity to the particular requirements of female heads of households. Importantly, it may be prudent to directly address the productivity constraints of female heads of households by arranging for special inputs, credit, and market facilities.

To consolidate the positive impacts of the group approach on agricultural productivity and the quality of life of farm wives, individual farmer extension services should be reduced so that extension officers can further concentrate their efforts on groups. Marginalized groups of individuals should be systematically targeted to ensure they also benefit from the positive impact of the common interest approach, which has the potential to ensure socially equitable rural development.

Key words: Economic impacts, social impacts, public agricultural extension, extension approaches, common interest group

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Introduction

The failure of the traditional individual extension approach to deliver sustainable agricultural and rural development has become a major concern for governments in developing countries. Many governments have invested heavily in agricultural extension programs, expecting increased agricultural

production and improvement in the lives of the rural poor, but these expectations have not been met. In addition to the increasing amount of information about the ineffectiveness of extension, there are also concerns about a lack of relevance and accountability. As part of improving the effectiveness of extension services, it is necessary to improve the way agricultural technology is delivered to farmers.

One of the more serious failures of past approaches to extension is the failure to reach marginalized groups of farmers. This failure is likely to perpetuate rather than redress their marginalization. Many researchers have found that non-marginalized farmers benefit more than their marginalized counterparts since they have resources to invest and thus exploit the potential of introduced technologies. Muyanga and Jayne (2006) on reviewing agricultural extension projects in Kenya found that farmers who could exploit the project benefits are usually those who had access to sources of income other than farming. Also farmers with small pieces of land tended to benefit less. Poor farmers are risk averse and thus not willing to engage their meager resources to try new technologies, thus adopting a 'wait and see' strategy. Nambiro *et al.* (2005) found that extension agents were significantly influenced by the farmer's wealth status, educational level and gender.

Past failures are well documented in many impact evaluation reports of past extension projects (Davidson, *et al.* 2001; World Bank, 1999). These failures have largely been attributed to the transfer-of-technology model that was widely adopted in the past (Roling, 1988). The last major extension effort in Kenya to adopt this model was the "training and visit" system of extension supported by the World Bank, which operated from 1982 to 1999. The World Bank (1999) evaluated this system and "found the current extension system to be ineffective and inefficient in delivering the needed services to the farmers. The institutional design has lacked a focus on farmer empowerment. As such, inappropriate incentives have resulted in a lack of accountability or responsiveness to the clients' needs. Most importantly, the system is not financially sustainable".

Since 2000, public agricultural extension services in Kenya have used an approach to extension known as the common interest group approach. It was designed to address both economic and social processes to overcome past weaknesses. The aim of working with common interest groups is to empower farmers to take up agri-business enterprises that are market oriented and income driven and that can thus be viewed as business entities rather than extension groups (Government of the Republic of Kenya, 2001). The common interest group approach is also designed to focus on marginalized groups of farmers by identifying and deliberately targeting them.

The formation of a common interest group is a structured process facilitated by agricultural extension officers. The officers use posters, pamphlets and other media to advertise opportunities for enterprise development. They offer extension opportunities to farmers who are willing to form groups with other farmers who have an interest in the same enterprise. Farmers who are interested in an advertised opportunity register, and a group is formed. To avoid discriminatory delivery of extension services, a wide spectrum of opportunities is identified to accommodate various categories of farmers with respect to resource endowment and socio-economic status. These enterprises may include organized production activities, such as agro-processing, packaging, and branding for identified markets, for existing and new enterprises.

Once members are registered, group activity development can commence. The group first elects a committee to coordinate its activities. Interested groups can also register with relevant government departments. The group is then facilitated to create a growth plan that includes a framework of activities required for the enterprise development to accomplish its goals and vision. Agricultural extension officers then guide the group through step-by-step activity development. Farmer activity implementation is at the individual farm level rather than at the group level. Group activity is limited to technology dissemination, commodity bulking, marketing and any other activities that enable the group to tap economies of scale.

Capacity building for the groups entails training the members in organizational development, technical aspects of enterprise development, and social development. The groups are first trained on aspects such as group organization, teamwork, group

leadership and management, networking skills, and participatory monitoring and evaluation. Then they are trained on various elements of entrepreneurship and enterprise development, including marketing management. Farmers are trained on social issues such as gender equity, environmental issues, HIV and AIDS, drug and alcohol abuse, democracy, legal rights, and governance.

If properly applied, the common interest group approach should lead to improved economic performance in terms of increased levels of farm productivity, food security, and farm income. Moreover, the approach should also improve aspects of the farmers' social well being, including the concepts of social equity and awareness of democracy, governance and human rights. However, the impacts of the common interest group approach remain unclear. Although previous monitoring and evaluation as well as impact assessment studies in Kenya have found positive impacts (OPTO INTERNATIONAL AB, 2006; Ministry of Agriculture, Ministry of Livestock and Fisheries Development, 2006), they have not applied rigorous scientific methodology and precise inferential statistical tools. In addition, they have not adequately dealt with econometric challenges resulting from a number of potential biases common to extension impact studies.

The overall objective of this research was to determine the social and economic impacts of the common interest group approach. The first specific objective was to determine the impact of the group approach on farmers' access to key agricultural support services such as agricultural marketing, credit and extension services. The second was to determine the economic impacts of the approach, as indicated by changes in agricultural productivity. The third was to determine the social impacts, as indicated by productivity changes for marginalized groups and the quality of life of rural farm wives. The fourth specific objective was to determine the approach's constraints and make recommendations to improve the livelihoods of rural farmers.

Methods

Survey Methodology

This study employed an ex-post facto research design. It utilized cross-sectional household survey data collected in February 2006 as part of internal impact assessment study for the first phase of the National Agricultural and Livestock Extension Program. This phase was jointly implemented between July 2000 and June 2005 by the Ministry of Agriculture and the Ministry of Livestock and Fisheries Development, with support from the Swedish International Development Agency.

The target population was made up of 534,000 households in 43 districts located in five of eight Kenyan provinces covered by the extension program. Within each district, focal areas were selected for implementation of program activities on the basis of the lack of other development programs, high human population densities, and high poverty levels. The respondents were the individual farmers, randomly sampled from four districts in each of the five provinces. The selected districts were stratified by ecological zones, population density, farming systems, and average farm size. Within each district, one sub district geographical unit called a division was selected randomly, and in this division, one focal area was selected randomly. A sample of 30 households was randomly selected in each of the four focal areas, resulting into a total sample of 120 farming households in each of the five provinces.

Members of each household were interviewed, and both open- and closed-ended questions were asked. Data collection also included a review of the farmers' records and corroboration of baseline survey information collected before implementation of the extension program.

Conceptual Framework

Traditionally, agricultural extension outcomes have been viewed as farm-level outcomes in terms of improved adoption of innovation and agricultural productivity. This view was consistent with the concept and practice of the traditional extension model of technology transfer and diffusion of innovation. However, the common interest group approach to extension is based on a more modern model of total human development. This model not only aims at improving adoption of innovation and agricultural productivity but also at providing the basis for sustained agricultural and rural development. To start with, the group approach targets improved farmer access to agricultural support services. In addition, the approach is designed to fo-

cus on social development and may focus on such aspects as social equity, community empowerment, human rights, gender equality, and democratic governance. Accordingly, this research expanded the scope of extension outcomes to reflect the more modern model of extension.

However, analyzing data to determine the impacts of the extension approach requires careful consideration to avoid bias in results, because the extension outcomes are estimated on outcomes at the farmer level, which are in turn influenced by other factors outside the control of the extension effort and may be unobserved by the researcher. The effect of the unobserved characteristics may, if not addressed in the analysis, be wrongly attributed to the extension approach. Analysis of impacts of extension efforts therefore requires an adequate strategy to deal with this econometric challenge.

Studies of the impacts of extension are vulnerable to two major sources of parameter bias. One form of bias follows from endogenous program placement. Suppose governments concentrate extension resources in highly productive areas and that this characteristic is not controlled for in the linear regression. A vivid demonstration of this potential bias is found by comparing the results reported in Bindlish and Evenson (1993; Bindlish *et al.,* 1997) with those in Gautam and Anderson (1999). Bindlish and Evenson found that access to extension services has a positive and statistically significant impact on the value of farm production in Kenya. Using the same data, Gautam and Anderson (1999) found that, when the fixed district effects were incorporated, the positive impact disappeared. The second source of parameter bias results from nonrandom farmer selection. If more farmers endowed with more resources or better skills are more likely to join farmers groups, and if these characteristics are not taken into account, the effects of better resource endowment or better skill will be wrongly attributed to the group approach.

The strategy employed in this research addressed the major sources of parameter bias in two ways. First, the parameter bias that may result from fixed locality characteristics was eliminated by including geographical dummies in the regression models. The impact of this strategy is that the effect of the group approach is compared by each geographical region and therefore the parameter estimates are not biased by fixed local characteristics. Second, to expunge biases associated with nonrandom farmer selection, the extension outcomes were modeled on first differences, meaning that the resultant parameter estimator is effectively a difference-in-difference (DD) estimator. This estimator compares the differences in outcomes for the nongroup members (control group) before and after receiving extension activities with corresponding differences in outcome for the group members (treatment group). Since the DD estimator relies on comparing differences in outcomes between group and nongroup farmers rather than comparing the outcomes themselves, the parameter estimates are not biased by nonrandom farmer selection bias.

Adopting the aforementioned strategy, modeling the extension outcomes as a linear function implies that the extension outcome can be expressed as: $\Delta Y = K + \alpha g + \beta v$, where ΔY is the change in extension outcome after implementation of the extension project, K is a constant equivalent to the Y intercept, g is the vector for group membership, and α is the corresponding group membership vector parameter estimate. The vector v represents geographical characteristics, and β is its corresponding vector parameter.

Measurement of Outcomes

Several variables were used to measure three main categories of extension outcomes. The first category, access to agricultural support services, was measured by three variables: the number of available markets for the 10 highest priority crops and livestock products produced by the farmer, the number of different credit providers who had provided credit to the farmer, and the number of extension organizations who were providing extension services to the farmer.

The second category of extension outcomes was change in agricultural productivity. Because the predominant farming system in the target area is mixed and diversified farming, measurement of productivity change was based on two each of the most popular crops and livestock enterprises. Productivity change was therefore measured as the combined change in the level of productivity for the production of maize, beans, milk, and eggs. The score for each was -1 if yield decreased, 0 if there was no change, and 1 if yield increased. Productiv-

ity change was further disaggregated by three traditionally marginalized social categories: households headed by females, households headed by individuals with no formal education, and households with a high number (six or more) of children.

The third category of extension outcomes was change in the quality of life of farm wives. Two variables were used as indicators: the number of household decisions in which the farm wife participated and number of working hours for farm wife. The number of decisions was a count of types of decisions that the farm wife participated in out of 11 important household decisions. Working time was the average number of hours the farmer's wife worked on productive, reproductive, and off-farm work within a period of one day.

For this study, the data were analyzed by using descriptive statistics to establish mean changes in the outcomes of interest. Multivariate analysis was also applied to test the hypotheses. All tests were one tailed because all hypotheses were directional in nature, and $P < 0.05$ was considered significant. The analyses utilized a Student t sampling distribution.

Results and Discussion

Table 1 shows the mean extension outcomes for group and nongroup members after implementation of the extension program. The increase in the number of accessible markets was minimal for both group and nongroup members, and there was not much difference between the two. Similarly, both groups had a negligible decrease in the number of credit providers. However, the mean increase in the number of extension providers was higher for group members than for nongroup members. Group members had a higher mean productivity increase than did nongroup members, and a similar result was true for female-headed households, households headed by individuals with no formal education, and those with six or more children. Group members also had a larger increase in the number of household decisions the farmer's wife participated in, as compared with nongroup members. There was also a larger change (decrease) in total hours worked by farmers' wives in households of which the heads were group members, as compared with households of which the heads were not group members.

Table 2 shows the group membership vector parameter estimates and p values for regressions of various extension outcomes as dependent variables. These results were obtained by using ordinary least squares regression. The regression model controls for both time and fixed locality effects, through dummy variables for year of extension commencement and district. Because of space limitations only coefficients of group membership, along with respective p values, are shown in the table.

The first alternate hypothesis states that farmers who are members of a common interest group have significantly higher access to agricultural support

Table 1. Mean changes in extension outcomes for group and nongroup members.

Category of outcome	Extension outcome	NonGroup Member	Group Member
Access to agricultural support services	Number of accessible markets	0.36	0.35
	Number of credit providers	−0.04	−0.04
	Number of extension providers	0.57	0.80
Agricultural Productivity	Overall Productivity	0.90	1.62
	Female headed household	0.40	1.40
	No education household head	0.17	1.40
	six or more children household	0.75	1.36
Farm wife quality of life	Number of Decisions farm wife participated in.	0.28	1.20
	Working time change for farmers wife	−0.18	−0.57

Table 2. Group membership vector parameter estimates and p values for regressions of various extension outcomes.

Category of extension outcome	Extension outcome (Dependent Variable)	Group membership Coefficients	p value
Access to agricultural support services	Number of available markets	-0.12	0.408
	Number of credit providers	0.01	0.668
	Number of extension providers	0.2	0.017**
Agricultural productivity by household types	Overall productivity	0.94	0.001**
	Female headed household	1.00	0.541
	No education household head	4.00	0.049*
	six or more children household	0.82	0.008**
Farm wives quality of life	Number of Decisions farm wife participated in.	0.61	0.048*
	Working time change for farmers wife	-0.09	0.047*

Note: *, significant at 5%, ** significant at 2.5%.

services than those who are not. The null hypothesis can be rejected for the number of accessible extension providers but cannot be rejected for the number of available markets and number of credit providers. The number of extension service providers accessible to farmers who are members of a common interest group was significantly higher than that of nonmembers. This finding is Consistent with the other research findings in Kenya (Muyanga and Jayne, 2006), that the number of extension service providers accessible to group members was significantly higher than that of nonmembers. This may be explained by the fact that extension providers target groups as entry points, owing to the many attractions of the group approach. Farmers who join the groups will most likely experience increased access to extension services.

However, the number of credit providers and market outlets accessible to farmers who are members of a common interest group was not significantly higher than that of nonmembers. This result is in agreement with previous research findings that small groups lack economies of scale, bargaining power, and political influence and are therefore unlikely to have significant influence on credit and market availability (FAO, 2001). Agricultural credit is not easily accessible to small-scale farmers (Kibaara, 2006), a situation that is partly asso-

ciated with the nature of agricultural credit, which has high covariant risk.

The second alternate hypothesis states that farmers who are members of a common interest group have significantly higher agricultural productivity than those who are not. The null hypothesis can be rejected for agricultural productivity. Farmers who are members of a common interest group appear to have significantly higher productivity than nonmembers. This may be a result of the fact that group members received more extension services than nongroup members, an occurrence that may in turn have increased the productivity of the former (Evenson and Mwabu, 1998). Another explanation is that group members may have improved their productivity by adopting more innovations than nongroup members; this would be in agreement with the results of Keith and Chamala (1995), who found that group communication, enhances the learning of innovations.

The third alternate hypothesis states that marginalized households who are members of a common interest group have significantly higher farm productivity than those who are not. The null hypothesis cannot be rejected for female-headed households but can be rejected for households headed by those with no formal education and those with six or more children. Female-headed households who are group members did not have

significantly higher productivity than those who are not members. Female household heads face more constraints to productivity than their male counterparts (Schultz, 1988), and women have less access to marketing, technology, inputs, and credit. The explanations underlying these barriers to access relate to reproductive work, mobility, education, and an array of socio-cultural characteristics, and the women's expected productivity increase may have been depressed by these constraints (Saito and Weidemann, 1990). However, households headed by farmers with no education and those with six or more children had significantly higher productivity when headed by group members compared with those that were not. This could be because marginalized individuals who were members of a common interest group received more extension services and were also likely to have higher productivity than their counterparts who were not group members.

The fourth alternate hypothesis states that farm wives whose households are members of a common interest group have significantly higher quality of life than those whose households are not. The null hypotheses can be rejected both for the change in working time for farmers' wives and the number of household decisions in which the wives participated. Farmers' wives whose households were members of a common interest group had significantly higher change (decrease) in working time compared with wives in nongroup households. Further, wives of farmers who are members of a common interest group had significantly higher decision-making participation than did nongroup wives. The group members' behavior may be influenced by a greater awareness of livelihood issues such as gender, democracy, and human rights, which are covered in group training.

Conclusions and Recommendations

This study highlights several possibilities for improving the effectiveness of the common interest group approach in Kenya. To start with, the approach's lack of significant impact on the availability of credit and produce markets calls for deliberate efforts to exploit existing opportunities to improve access to these services. Common interest groups could be facilitated to come together to form associations of small groups. These associa-

tions can benefit the affiliated groups and individual members by increasing their knowledge, economies of scale, and bargaining power to gain better access to credit and produce markets (FAO, 2001). Such a strategy has been employed by Farming Systems Kenya in an initiative that brings together farmer groups to form a federation, with the core business being collective marketing of farm produce (Kibaara, 2006). The federation also undertakes the joint purchase of farm inputs and provides linkages with extension and credit providers. A similar strategy of group associations has also been used to initiate community owned and managed financial institutions by using the Constituency Development Fund, a decentralized government financial facility in Kenya.

More interventions may be necessary to improve access to agricultural markets. It may be necessary to organize group training on marketing, including training in financial and business management and in production and marketing systems. Agroprocessing technology could also be promoted to enhance primary agro-processing and provide new market opportunities by reducing perishability and enhancing value added. Furthermore, it may be prudent to link groups with the private sector to increase access to market information, technology, and new market opportunities (Kindness and Gordon, 2001).

It may be necessary to take intervention measures to address the special constraints faced by female heads of households and other marginalized groups. To ensure these households benefit equally with other farmers from the common interest group approach, extension activities could be scheduled and timed with sensitivity to the special requirements of female farmers, including their reproductive roles at the household level (Saito and Weidemann, 1990). It may also be prudent to directly address their productivity constraints by arranging for special inputs, credit, and market facilities. This study found a significant impact on the level of farm productivity for households headed by group members with no formal education and those headed by group members with six or more children. Therefore, it appears that the common interest group approach has the potential to ensure a socially equitable rural development. As such, systematic targeting of the approach on

marginalized individuals is recommended to ensure that more of them benefit from its positive impact.

Given the positive impact of the group approach on agricultural productivity and on the quality of life of farmers' wives, it may be prudent to reduce the number of farmers covered under the individual farmer approach so that extension officers can dedicate more time to common interest groups. In this way the extension officers can handle more groups and therefore increase the percentage of farmers receiving the group extension approach.

Future research should be useful in determining the effectiveness of various extension methodologies applied in the group approach, the optimum size and composition of the groups, the optimum frequency of meetings, and the length of time required to nurture self-sustaining groups. It may also be prudent to determine the incentive factors required to get marginalized groups of farmers to join and remain members of common interest groups.

Acknowledgements

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