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# Decentralization and Access to Agricultural Extension Services in Kenya

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## Abstract

*The form and content of decentralization has dominated development discourse and public sector reform agenda in Kenya in the last two decades. The case of agricultural extension service presents decentralization in a difficult context partly due to lack of information on its possible diverse impacts especially on resource poor farmers. This paper explores the effect of decentralization of agricultural extension on access, accountability and empowerment, and efficiency of delivering services to farmers. Secondary data, participatory research methods and primary data from a random sample of 250 farmers were used. Data was analyzed using descriptive statistics, multivariate analysis and logistic regression.*

*The results show that there is improved access to extension services with increasing level of decentralization. Farmers from areas with higher decentralized extension also showed enhanced level of awareness of different channels for delivery of extension services. This improved knowledge, being an important component of empowerment of the farming community, resulted from the increase of service providers, who displayed synergy in their multiple methods of operation. Public delivery channels were the most affordable and were also ranked first for quality. Income, literacy levels, distance from towns and access to telephone significantly influenced access to extension services. Gender of the household-head was a key determinant for seeking out extension services in areas with high concentration of agricultural activities.*

*For a pluralistic system to work, there is need to for better co-ordination between the various groups. Although there is evidence of partnership and synergy between service providers, there appeared to be little effective co-ordination of the groups involved. The government, and other stakeholders should work towards developing a strong institutional framework that will guide and enhance this mutually beneficial partnership.*

**Key Words:** Extension services, decentralization, partnerships, policy reform, Kenya

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## 1. The Evolution of Extension Provision

The importance of agricultural extension in rural development is widely acknowledged, particularly in developing countries where the majority of the population lives. Agriculture is the main source of livelihood, and access to information is generally costly (Wanga, 1999). Since Kenya's independence in 1963, agricultural extension services were largely provided by the government until the late 1980s. Through the 1990s, the established modes of delivery of extension services began to shift in favour of those that involved farmers in the design or prioritization of these services. This re-orientation of extension towards participatory processes was catalyzed by the increasing realization that effective and sustainable extension programs could only be achieved with the more active participation of the various end-users, especially farmers.

Decentralization of agricultural extension services in Kenya took two main approaches. First, it involves the decentralization of government responsibility for extension services through structural reforms with the objective of shifting extension to other institutions and improving accountability and responsiveness. Second, there is the decentralization of management programs through farmer participatory programs in which the end-users assume greater responsibility for designing appropriate curricula, and disseminating the information.

According to Anderson and Crowder (2000), re-organization of the extension system has evolved to include four broad forms of delivery systems: (i) ***Public delivery and public finance*** which essentially comprises the traditional government agricultural extension that continues to persist although with greatly diminished outreach and constrained by a lack of sufficient funding; (ii) ***Public delivery and private finance*** whereby government staff is contracted by private agencies to deliver extension services; (iii) ***Private delivery and private finance*** whereby commercial entities provide their suppliers with the extension services required to improve their technical efficiency. This mode of delivery is prevalent in commodity out-grower schemes and highly commercialized high-value agriculture; and (iv) ***Private delivery and public finance*** which entails the outsourcing of responsibility for extension delivery to private sector providers such as NGOs and CBOs.

## 2. Decentralization and Efficacy of Extension Services

With the increase in the number of delivery methods, largely due to decentralization, challenges facing extension services in Kenya include (i) re-orienting the public delivery of extension services to improve its efficiency, (ii) enhancing its access to farmers and other clients, (iii) improving accountability of service providers to their customers, and (iv) maintaining relevancy to different end-users (Kenya, 2001). To determine the best way to design the appropriate institutional structure to meet these challenges, there is need to investigate the factors that influence farmers' access to extension advice and to identify the relative efficacy of various extension delivery mechanisms. The paper analyzed relationship between decentralization and extension efficacy by highlighting the experiences in Eastern (agriculturally low potential) and Western (relatively high potential) Kenya.

## 3. Methodology

Both secondary and primary data were used. A structured questionnaire was administered to gather data from farm households and extension service providers.

A multivariate analysis using a logit model was estimated as:

$$C_{ij} = W_{ij}\alpha + X_{ij}\beta + Y_{ij}\gamma + Z_{ij}\delta + \varepsilon_{ij} \text{-----} (1)$$

Where:

- $c_{ij}$  is a dichotomous variable that takes the value of 1 if the individual  $i$ , who resides in region  $j$ , does access extension service given the event of demand for such a service during the one-year preceding the survey;
- $W$  denotes a vector of household head characteristics (age, education level, wealth status, gender and the number of community organisation to which the household members resident on the farm belongs);
- $X$  denotes a vector of farm characteristics (total livestock units and total cropped area);
- $Y$  denotes the approximate farm income;
- $Z_j$  denotes the vector of observable characteristics of region  $j$ , including level of decentralisation of extension service. However, since deliberate effort was made to select regions that were as similar as possible, it was assumed that this variable would represent level of decentralisation; and,
- $\varepsilon_{ij}$  denotes the vector of un-observable characteristics of region  $j$ , measurement and sampling errors.

The variable  $c_i$  in equation (1) was desegregated further as described by Semana (1999) to include (i) informal extension, and (ii) formal extension. Informal extension was further divided into two, i.e., the demand and supply driven informal extension services. Informal type of extension is one that has no syllabus and the farmer's problems and needs are the main considerations. It has no classroom, and advice is provided in the farmer's home or farm, or any convenient place. The formal type of extension is planned, has written objectives and training content. This type of extension is carried out through short courses, field visits, or short-duration tours at community centres, research stations or for a longer duration of time at designated farmer-training centres. Equation (1) was estimated for:

1. **Demand-driven informal extension** - where farmer expresses demand for extension service.
2. **Supply-driven informal extension** - where extension agent visits the farmer without latter's request.

The estimation of the parameters in (1) would have required the use of the Heckman two-step procedure to correct for the selectivity problem. The question of access was only applicable to those who expressed demand for extension service during the reference period, and whose characteristics might differ significantly from the group that did not express demand (Greene, 1997). Such a procedure was not applied, since the whole sample fell in the "expressed-demand" category. This approach has also been applied to evaluate the impact of availability and density of health infrastructure on access to health care in Peru (Valdivia, 2002).

To test the factors affecting the willingness to pay for extension services, a Tobit Model (Tobin, 1958) was used. The client is assumed to know the inherent value of the service (extension).  $L_i$  denoted an unobservable index variable. The decision making process of potential farmers' willing to pay was expressed as:

$$WTP_i = L_i = \alpha + \beta_i X_i + \varepsilon_i \quad \text{If } \beta_i X_i + \varepsilon_i > 0 \text{ -----(2)}$$

Where:

$$WTP_i = 0 \quad \text{If } \beta_i X_i + \varepsilon_i \leq 0$$

$$\varepsilon_i \approx N(0; \sigma) \quad I = 1, \dots, n$$

$WTP_i$  was the observed response of the  $i$ th farmer.  $L_i$  is continuous for the farmers willing to pay for extension services, and  $WTP_i = 0$  for the farmers who are not willing to pay. A dichotomous choice (simple referendum) survey design was used to select the willingness to pay. Following Gorham (1998), various levels of payment that respondents were willing to pay for extension services per visit were estimated. The estimated amounts were used to calculate a lower bound mean (LBM) of household  $wTP_i$  for extension services as per Kristrom's non-parametric method. Kristrom's (1990) non-parametric method consists of grouping the frequency of the "yes" response to the bid range in a monotonically decreasing order with increasing bid ranges and connecting the points by linear interpolation. To obtain the mean of  $wTP_i$ , the integral below the cumulative density function is approximated as shown in the following equation:

$$E(x) \text{ in the interval } x_1 - x_2 \int_{x_1}^{x_2} xf(x)dx = x[F(x_2) - F(x_1)] \text{ for } x_1 \leq x \leq x_2 \text{-----(3)}$$

Where  $x_1$  and  $x_2$  are the lower and upper limits of bid  $x$ , respectively, and  $f(x)$  and  $F(x)$  are the probability density function and cumulative distribution function, respectively. The mean willingness to pay is the sum of all the sub-means. Using the lower limit of each interval for every bid  $x_i$  and applying equation (3) for each interval, the mean willingness to pay is estimated as:

$$LBM = \pi_0(P_0) + \sum_{i=1}^k \pi_i(P_i - P_{i-1}) \text{-----(4)}$$

where  $\pi_0$  is the cumulative percentage of respondents willing to pay the initial or smallest finite amount offered ( $p_0$ ), and  $k$  is the number of subsequent amounts offered.

If  $wTP_i$  is greater than zero, the observed variable becomes a continuous function of the explanatory variables, and zero otherwise. The probability of  $wTP$  and those farmers unwilling to pay for extension, given characteristics  $\chi_i$ , is obtained by:

$$P_{f1}(Y_1 = 0) = 1 - F(\beta' X_{i/\delta}) \text{-----}(5)$$

$$P_{f1}(Y > 0) = P_c = F(\beta' X_{i/\delta}) \text{-----}(6)$$

Where  $F(\cdot)$  is the standard normal probability distribution function evaluated at  $\beta' \chi_{i/\delta}$  and  $\delta$  is the standard error. The conditional expectation is that the farmer is willing to pay if  $P_f$  (the farmers' stated price) is greater or equal to  $P_c$  the estimated LBM from the sample respondents. The farmer is not willing to pay if  $P_f$  is less than  $P_c$ .

Where  $P_f$  is the individual farmer's stated price while  $P_c$  is the LBM.  $P_{f1}$  is continuous where  $P_{f1} \geq P_c$  and zero where  $P_{f1} < P_c$ . Whereas  $\beta$  is a vector of unknown coefficients, and  $X_i$  is a vector of individual household explanatory variables that influence willingness to pay.  $\delta$  is the standard error.

#### 4. Survey Results

##### 4.1 Preferences of Extension Delivery Channel

Respondents were presented with four choices of extension and information delivery systems that covered all possible sources and were asked to rank them on the basis of quality (proxied by the likelihood of receiving advice from trained personnel) and affordability. The four choices were: (i) **Public service**, which included any service provided by government extension agents or research institutions; (ii) **Private service providers**, made up of agrovets and privately employed animal health assistants (AHAs); (iii) **Community-Based Organizations (CBOs)**, Non Governmental Organizations (NGOs) and other non-governmental nonprofit agencies; and (iv) **Media**, which comprised any relevant information source from newspapers, pamphlets, radio, or television (Table 1).

**Table 1: Rankings of Extension Services Delivery Channels**

Extension service delivery channel	Ranking by Respondents	
	Quality	Affordability
Public Service	1 (73)	1 (70)
Private Service providers	2 (19)	3 (12)
Community based organisations	4 (2)	2 (20)
Media	3 (16)	4 (8)

[Figures in parenthesis is % of respondents who ranked the delivery system in the position]

Public delivery channels were the most affordable since they are provided at no cost to the client and were also ranked first for quality. This suggests that government extension agents are highly regarded by farmers and are more likely to be sought out for advice and that such advice, once given, is relatively more likely to be operationalized by the farmer. Delivery of extension by CBOs and other similar organizations was surprisingly perceived to be of the lowest quality among the four channels. Given that such organizations also offer fairly affordable services, and that they are at the forefront of efforts to emphasize demand-driven extension services, expression of limited confidence is puzzling and raises interesting questions for further investigation. Why exactly do CBOs have such a relatively poor reputation? Are CBOs and similar organizations truly underperforming, or do misconceptions regarding their role in extension persist that serve to weaken their effectiveness?

#### **4.2 Access to demand-driven Extension Services**

Survey results show that distance from towns and access to telephone significantly influenced access to agricultural extension services, especially in rural areas. The closer the client is to the source of extension, the more likely s/he is to seek its services. The positive and significant relationship between telephone access and seeking out extension services could be explained by its facilitation of direct communication that allows meetings to be arranged in



advance and farmers to ensure that the extension service provider is available before making a visit.

Income and literacy levels of the household head had a significant impact on the likelihood of receiving demand-induced extension services. Income of the household-head positively and significantly increased the probability of accessing extension. Illiteracy of the household head is associated with a diminished likelihood of seeking (and receiving) extension advice. Considering the raging debate on the benefits of a demand-driven extension system, these results are salient and caution against relying too much on such a method of service delivery that would marginalize the poor and ill-informed. This segment of the population is not likely to benefit equitably from such advisory services considering the widespread rural poverty as about 56% of the population is below the poverty line (1 US\$ per day).

In relatively high potential areas such as in western Kenya (Kakamega district), results showed that gender of the household-head was an important determinant in seeking out extension services. Male household heads were significantly more likely to seek out extension services. This suggested the possibility of male bias in extension demand. If traditional gender roles constrain women from seeking agricultural advice, efforts to emphasize a demand-driven extension system need to include mechanisms to address the prevailing gender-based demand differential.

In agriculturally marginal areas such as in eastern Kenya (Makueni district), results indicate that farmers living in areas of higher decentralization were significantly more likely to access demand-induced extension. This result coincides with the greater knowledge that respondents had extension opportunities open to them and were therefore better placed to actively seek those services. Membership in Community-Based Organizations was also associated with a positive and significant effect on access to demand-induced extension services by farm households.

### **4.3 Access to supply-driven Extension Services**

The results from the logistic regression focusing on supply-led extension indicated that visits from extension agents were significantly influenced by the wealth status of the farmer, and his/her educational level. As a large majority of these visits (17 out of 22) were from government agents, the results indicate that their choice of households to visit is not entirely random and, for whatever reason, they are more likely to patronize more well to do farmers.

Households with access to a radio, a television or a telephone were more likely to be visited or offered supply-driven extension services. The age, education level, and sex (male) of the household head were positively and significantly related with the probability of an extension visit. Households that are located farther away from the town center and require extension agents to spend more time and fuel resources to access are also significantly less likely to be visited. These results provide an indication of the characteristics of households that are often over-looked by extension agents, when providing supply-driven extension services.

The effect of decentralization and participation in CBOs on receiving an extension visit, while positive, though was not significant. This could be because NGOs/CBOs favor seminars, collective field visits, and tours to demonstration sites than home visits. This has implications on their operational and funding strategies if they are to effectively engage in providing extension services.

### **4.4 Willingness to Pay for Extension Services**

Commercialization of extension services is only possible if farmers are willing to pay for these services. Where extension services have previously been provided free of charge, it can be difficult to establish the latent commercial demand for agricultural extension information. The survey results indicated that 49% of the farmers expressed willingness to pay for extension visits. The contingent valuation (CV) methods was used to establish how much farmers would be willing to pay. The mean willingness to pay was estimated at Ksh. 262 (US\$ 3.50) per extension visit if the services are efficient. This compares favourably with the

Ksh. 200 consultation fee that is typically charged by veterinary service providers. The results imply that there exists significant demand by farmers for extension information services, making it potentially attractive for commercialization or privatization if high-quality extension services can be provided. These findings suggest that cost recovery mechanisms might be able to enhance the funding of extension delivery systems that farmers indicate they find useful and important.

Many of the same factors that affect household use of extension also influenced their willingness to pay for extension services. In particular, ownership of or access to radio, television or telephone positively and significantly increased willingness-to-pay for extension visits.

## **5. Policy Implications**

This paper investigated the consequences that the decentralizing of agricultural extension services has had on farmers' access to and involvement in setting the extension agenda. In areas of greater decentralization, farmers were more likely to pro-actively seek extension advice. This suggests that decentralization spurs greater awareness of the availability of such services, which may empower farmers to actively seek out extension advice.

The policy implications of these findings suggest a need for restructuring of the extension system to favour NGOs and CBOs that have an explicit extension mandate where they have the comparative advantage in providing farmers with pertinent technical advice. Continued investments in forming and supporting farmers' groups, is also likely to yield high returns as farmers increasingly build their capacity and ability to demand services that are compatible with their needs. However, as the extension efforts of NGOs and CBOs are largely demand-driven, the government has a crucial role to play in guaranteeing that certain populations are not deprived of such services, such as in low potential or remote areas. An important step in ensuring that extension resources are efficiently utilized is to create a mechanism for

coordinating the extension activities of both the government and private agencies to ensure that each player works to their strengths and efforts are not duplicated.

Evidence from high potential areas suggests that government agents are the preferred provider of agricultural information as they are both considered to be the most affordable and more accurate source of information. Nonetheless, with the limited government funding, other modes of extension delivery are necessary to complement government efforts and fill the vacuum in accessing the extension services that may arise. The findings of this study point to the importance of creating a well coordinated mechanism that allows key stakeholders in agriculture to maximize their efforts by collaboration.

The government seems to have a comparative advantage in the provision of extension services, at least, as perceived by the farmers themselves. Since the government alone cannot finance all extension efforts, it should provide an enabling environment for the enhanced effectiveness of other players. One possible and under-exploited resource with documented potential is the use of national radio and television to broadcast targeting programs with extension content. Development practitioners are beginning to recognize the value of such an information delivery system and various initiatives in several countries are already making use of this mechanism (Eltzroth et al., 2003).

Community-Based Organizations and other similar agencies need to make concerted efforts to sensitize skeptical farmers to benefit from the services they offer. It is also necessary to ensure that the extensions services offer relevant and high-quality information to their clientele. Encouraging partnerships with local farmer organizations would increase awareness and is also likely to improve the perceptions that some farmers hold regarding these agencies by actively including them in their activities. Another important finding suggests that males were significantly more likely to seek extension advice or to be visited by agents. This reveals the critical need to gender-sensitize extension providers and to create programs that

specifically empowers female farmers to proactively seek all available resources of information pertinent to improving their farm productivity and management systems.

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