

# The role of agricultural extension services in socio-economic development of east Africa: A critical review



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## ABSTRACT

*Diverse agricultural extension services and approaches have been pursued in east Africa with varying degrees of success. The paper explores the extent to which agriculture extension services provided by both public and private sector have been translated into meaningful social and economic development of farmers. Several dynamics in the pursuit of extension programmes include shortage of extension staff and poor working facilities, leading to inadequate capacity of unbalanced technologies and low participation of private sector were noticed. The paper outlines a number of recommendations including but not limited to strongly involve stakeholders in technology development and transfer. This will assist farmers identify their felt needs rather than the needs being determined by extension service providers.*

**Keywords:** agriculture services, agriculture extension services, socio-economic development

## 1. INTRODUCTION

Poverty reduction is the hub to the arena of development economics. With more than 75% of the world's poor living in rural areas, the question of balancing extension agricultural services for improving socio-economic development of peasant farmers is viewed as among the leading fundamental agenda to the world's campaigns for improving rural economy (Laporte 2013: 1). Agriculture extension services is basically aimed at transforming and strengthening pluralistic agricultural wing and advisory systems in moving towards the broader goal of increasing farm income and improving rural livelihoods. Anderson (2007: 6) defines the terms *agricultural extension* and *advisory services* as 'the entire set of organizations that support and facilitate people engaged in agricultural production to solve problems and to obtain information, skills and technologies to improve their livelihoods'.

A critical review from a wide range during implementation of agriculture extension services across Kenya, Tanzania and Uganda has it that each country underwent dynamic and diverse agricultural transformations. To what extent changes have met the desired outcomes of agriculture services, this paper aims to unveil the impact of those implemented programmes in

a wider perspective. Further, the paper discusses the role of agricultural extension services in socio-economic development of farmers in east Africa.

The paper is organized into various areas including the introduction, origin and development of extension services, models and impact of extension services in east Africa. It additionally highlights challenges and underlines recommendations.

## **2. THE ANTIQUITY AND DEVELOPMENT OF AGRICULTURAL EXTENSION SERVICES**

The sharing and use of progressive agricultural technology and management practices can be traced back thousands of years in different parts of the world, including China, Mesopotamia, Egypt, and even in the Americas (Swanson 2011: 11). The origins of public- or government-funded extension and advisory systems can be traced back to Ireland and the United Kingdom during the middle of the nineteenth century. During the potato famine in Ireland (1845–1851), agricultural advisors helped Irish potato farmers diversify into different food crops. Various European and North American governments observed this development, and ‘traveling instructors’ started being used in the second half of the nineteenth century by many countries.

The term *extension* itself was first used to describe adult education programmes organized by Oxford and Cambridge universities in England starting in 1867; these educational programmes helped extend the work of universities beyond the campus and into the neighboring communities (Swanson 2010: 1). This term was later formally adopted in the United States in conjunction with the land grant universities that were originally established as teaching institutions during the 1860s. Research activities were added in 1887, and extension activities were started in the 1890s and then formally added in 1914 as part of each university’s official mandate.

The India’s green revolution in the 1960s has provided substantiation on ways to uplift production, livelihoods and food security for the rural poor. Indeed, it influenced agricultural improvement strategies in other developing countries (Ravallion and Datt 1998: 63). Agricultural extension services are one of the most common forms of public-sector support for knowledge diffusion and learning. Extension has the potential of bridging discoveries (and mitigation methods) from research laboratories and the in-field practices of individual farmers (Birkhaeuser and Evenson 1991: 620). Broadly, agriculture extension services in developing countries were mainly designed to facilitate technology transfer from agricultural research institutes to the farmers. The package consists of advice, know-how and technology transfer as well as input provision directly to farmers.

## **3. PROBLEM STATEMENT**

Agricultural extension services have a role to increase farm income and to improve rural livelihoods. Indeed, it provides market opportunities that may be tapped by households engaged in scientific and technological farming.

However, strengthening agricultural extension and advisory systems is too complex (Swanson 2009: 25). For the nation to improve livelihoods of the rural poor, especially small-scale farmers, then a serious strategy is needed.

Various extension programmes undertaken in east Africa do not show the extent, magnitude and levels such programmes have fully translated into individual peasant life transformations. Much remained unknown on the assessed role of agricultural extension services contributing to the socio-economic development of small and medium farmers in east Africa. This study examines the unknown phenomena played by agricultural extension services to the development of farmers in Kenya, Tanzania and Uganda.

## **4. METHODOLOGY**

This paper employed desk research and documentary analysis. The material reviewed is based on case studies and impact assessments of various large-scale agricultural extension programmes carried out across Kenya, Tanzania and Uganda. Most of the empirical data from this study comes from five in-depth case studies of the Farmers Field School (FFS) by IFPRI in Tanzania, National Agricultural Advisory Services Program on Household Production and Welfare in Uganda (NAADS), National Agriculture and Livestock Extension Program (NALEP) Impact Assessment in Kenya, Farm-level Applied Research Methods Programs for Eastern and Southern (FARMESA) programme, a regional collaborative initiatives for Kenya, Malawi, Tanzania, Uganda, Zimbabwe, Zambia, Botswana, Mozambique and South Africa as well as the World Bank *Agriculture and rural development discussion paper number 44*.

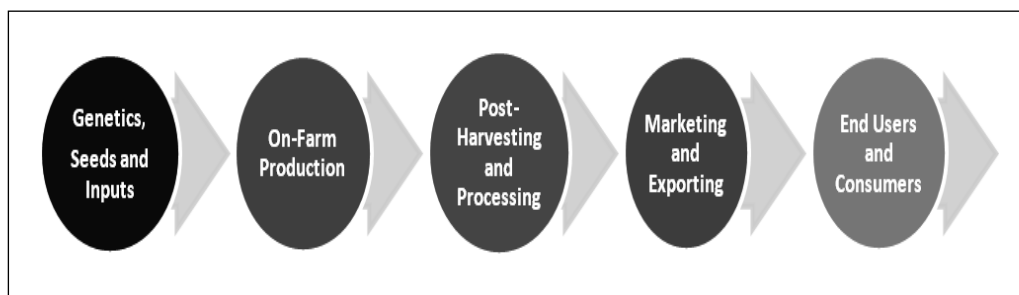
## **5. THEORETICAL MODELS AND EVIDENCE**

### **5.1 Overview**

A diversity of approaches to extension delivery has been endorsed over the years, across the world and east Africa in particular. Early models focusing on transfer of technology using a ‘top-down’ linear approach were criticized due to the passive role allocated to farmers, as well as the failure to factor in the diversity of the socio-economic and institutional environments facing farmers and ultimately in generating behaviour change (Chambers and Ghildyal 1984; Birner *et al.* 2006: 9). A number of models have been implemented since the 1970s, combining approaches to outreach services and adult education, including the World Bank’s Training and Visit (T&V) model (Anderson *et al.* 2006: 52), participatory approaches and most recently farmer field schools (FFSs) (Van den Berg and Jiggins, 2007:663). Additional extension modalities include ICT-based delivery, which provides advice to farmers on line and other approaches such as the promotion of model farms (Birner *et al.* 2006: 37). Below is the analysis of various models implemented in most developing countries including the East African region as follows:

## 5.2 Ministerial-based agricultural extension or advisory services approach

This was the primary extension model introduced into various developed and developing countries after independence. As illustrated in Figure 1 below, most of these extension systems were based on a linear concept of technology transfer, which was expected to serve as an effective link among research, extension and farmers. This technology transfer approach was greatly reinforced during the Green Revolution when new crop varieties and accompanying production practices were formally introduced to all types of farmers as many countries worked to achieve national food security. However, the model was not sufficient to serve the diverse needs of rural farmers beyond food security.



**Figure 1.0 Traditional technology transfer system for staple food crops**  
(Source; Swanson, 2010: 13)

## 5.3 Participatory extension approaches (animation rural)

*Animation rural* was the first systematic attempt to introduce participatory methods into extension systems. This approach, introduced by the French in francophone Africa, was based on a participatory, emancipatory philosophy with parallels to the philosophy of Paulo Freire in Brazil (Nagel 1997: 15). The approach helped raise group consciousness and collective action to define, understand and address local problems and to integrate rural areas into national systems and programmes.

## 5.4 Farmer-based extension organizations

The best example of a fully demand-driven extension system is one that is directed, operated and financed by farmers themselves. Depending on the country, these extension systems generally operate under different management structures and with different sources of financial support (Cox and Ortega 2004: 26). It is important to note that large-scale commercial farmers, who have better leadership and better organizational and technical skills, as well as more economic power, frequently dominate these farmer-controlled extension systems.

## **5.5 Market-oriented extension approaches (commodity-based advisory systems)**

Advisory services for major export crops have been in existence since colonial times and are still common in many developing countries that produce major export crops such as rubber, tobacco, coffee, cocoa, sugar cane, oil palm, bananas, oranges and cotton (Bingen and Dembèlé 2004: 85). Generally, a private-sector firm or a parastatal organization is responsible for operating these commodity-based advisory systems.

## **5.6 Innovative, market-driven extension approaches**

The emerging market-driven model of organizing extension systems is a 180-degree change in direction from the traditional linear model of linking research to extension to farmers. This innovative, market-driven approach is consistent with the agricultural innovation systems framework, especially within a rapidly changing global economy (Katz *et al.* 2008: 6, 7).

## **5.7 Non-formal education/extension approaches (farmer field schools)**

The Farmer Field School (FFS) approach to organizing extension programmes began in Indonesia over two decades ago as a means of educating farmers how to incorporate integrated pest management (IPM) practices into their farming systems, especially for rice production. This approach primarily uses non-formal education methods to teach farm leaders in each community how to reduce pesticide use, which in turn helps increase farm income. Based on an impact evaluation of 25 different case studies, Van den Berg (2004: 680) concluded that Farmer Field Schools had a significant impact on reducing the use of pesticides and increasing yields. Perhaps more importantly, however, this approach stimulated continued learning and strengthened the social and political skills of farmers. In some countries in East Africa, these developments triggered a range of local development activities, relationships and policies (Davis *et al.* 2009: 24, 25).

One central concern about the FFS model is the number of field extension workers needed to conduct these educational programmes (generally 10 or more weekly training sessions per growing season), plus the programme and travel costs required to effectively implement this approach. In short, this is a relatively expensive, labour-intensive extension model that reaches a small number of interested farmers (Rajalahti *et al.* 2005: 4).

## **5.8 The ICT-based agricultural extension service delivery (IAESD)**

The information, communication and technology-based agricultural extension services are the most current and up-to-date model resulting from the fastest growth and advancement in technology across the globe (Nyamba 2012: 1). Evidence from various farmers' activities in the world such as India, China and Indonesia indicates quite a large number of ICT users in farming activities. This includes mobile phones for communication and market updates, internet facilities for drawing knowledge and skills for farm project start-ups as well as market searches. Although it is mostly individually centred, this popular approach of the current age is probably the most efficient, least costing and convenient for the majority in developing nations who can afford the purchase of such ICT electronic services.

Almost all models discussed were experienced in the region of east Africa, although few of them were successful including farmers' field school and currently ICT-based extension services. Given their acceptance and affordability in east Africa, these models seem to render direct benefits to the farmers with speed and accuracy, unlike other models.

## **6. CRITIQUES TO THE ROLE OF AGRICULTURE EXTENSION SERVICES IN EAST AFRICA**

Although all countries of east Africa, that is, Kenya, Tanzania and Uganda, pursued a transformative agricultural revolution through extension services provision, the natures of services were unequal. Such inequalities have also brought a diverse and dynamic roles' outlook. Indeed, it was very difficult to clearly have research reports on how socially and economically farmers in east Africa have benefited from agricultural extension service programmes. For instance in Tanzania, a report on the Farmers Field School only was able to establish both the nature of extension service practised and little knowledge on social and economic impact. Data on characteristics and impact of extensions services in Uganda captured through National Advisory Services Programme (NAADS) provides an insight into the nature of extension services pursued that was in the form of agriculture and livestock projects.. The report does not directly provide the role of extension services to the farmers' socio-economic development, unlike that of Tanzania that was largely based on agriculture. In Kenya, the situation was more or less similar to Uganda in terms of the nature and scope on the type of extension services provided.

The National Agriculture and Livestock Extension Programme (NALEP) was responsible for providing extension services in Kenya. Moreover, reports on NALEP performance rarely provide what farmers felt about the social and economic impact of extension services characterized in Kenya. To this end, more characteristics are being captured from the identified sources than the impact of extension services in east Africa. In such a situation, research is highly needed to study the social and economic development indicators of farmers who are recipients of agricultural extensions services in east Africa.

### **6.1 Agricultural extension services (Farmers Field Schools) in Tanzania**

Tanzania responded diversely to the provision of extension services. As part of the Tanzanian government's efforts to improve access for small-scale farmers to research and extension, the decentralization policy has helped increase the relevance of extension services for farmers through shifting the planning to Local Governmental Authorities (LGAs). This led to the creation of 6 700 Farmer Field Schools, training of 70 000 farmers, and the provision of fertilizer subsidies to 2 million farmers.

Tanzania's public extension comprises 75 staff members and is managed by a team of 13 senior staff, according to the IFRI report (2011: 2). Only four staff members have Master of Science degrees, ten hold a bachelor degrees and the rest of the team completed two to three years for agriculture diplomas. Women account for 69% of senior management staff. There are nine subject specialists, none of them has a graduate degree and 55% of which are female. Field level extension workers constitute the bulk of staff (70%); all of them hold a two- to three-year

agricultural diploma, and 86% are female. There are two other groups of workers: Information, Communication & Technology (ICT) support staff and in-service training staff. The MEAS report (2010: 13) indicated that the public sector does not employ in-service training staff and ICT support services personnel.

Moreover, the current expenditure on agricultural research as a proportion of agricultural GDP is only 0.3 per cent. In 2009/10, 75 private Agricultural Service Providers (ASPs) and 118 Local Government Authorities staff were trained on contracting out provision of extension services delivery to farmers. It was noted that most agricultural service providers have inadequate capacity for service provision. In addition, IFPRI found that Farmer Field Schools (FFSs) are a popular extension approach in Tanzania.

Since the aim of extension services was to increase farmers' incomes and to raise the living standards of the rural population, in Tanzania, the impact on the ground was too limited to achieve a significant breakthrough in terms of socio-economic improvements. In order to witness a visible impact in terms of development, it is necessary that a significant number of farmers adopt and implement successfully new technologies. Moreover, sketchy literatures expose clear-cut evidence on the extent farmers have socially and economically benefited.

## **6.2 National advisory services programme (NAADS) in Uganda**

Examining the Uganda's National Agricultural Advisory Services (NAADS) programme, the impact on agricultural households' access to extension services, a dynamic understanding was revealed. The findings from the NAADS household production and welfare survey in Uganda indicate a lower participation rate of vulnerable households in NAADS. Irrespective of vulnerability status, households participating in NAADS had higher access to extension services and credit, but the quality of services was of concern. No clear evidence of the programme's impact on the increased use of improved technologies, crop yield and sales by households was observed (NAADS 2007: 14).

Reviewing Households' Participation in NAADS it was further indicated that, while the issue of vulnerable groups in the NAADS programme might have meant to target individuals, the share of households participating in NAADS programme in 2005/6 and 2009/10 by household type, indicated only 27 per cent of about 5 million agricultural households in the country, having increased from 6 per cent of 4.2 million agricultural households in 2005/6.

One of the short-term benefits of household participation in NAADS is access to extension services provided by the ASPs. The relationship between participation in NAADS and life transformation shows that up to 90 per cent of households participating in NAADS in 2009/10 had increased their productivity up 60 per cent, compared with only 28 per cent of non-NAADS households. Benin *et al.* (2011:6) also found a high and statistically significant increase in access to advisory services by farmers participating in NAADS in the period 2004 to 2007, which translated into peasants' economic development mostly in livestock farming. Evidence from FGDs revealed that the apparently low level of access to extension services by NAADS beneficiaries in 2005/6 compared with 2009/10 was due to the fact that in the early NAADS (2001/2–2005/6), extension service delivery was undertaken by local government extension staff who were few in number

(one staff per sub-county), and in most instances doubled as sub-county NAADS coordinators (NAADS 2007: 16).

Generally, the NAADS revealed that over 82.3% of respondents agreed that the programme had scored some substantial benefit compared with 11.94% who disagreed that the programme had benefited them in any way. The areas of recognizable benefits mentioned were income levels, productivity, improved technology, skills and practices, diversification of production base, and access to markets, among others. It is important to note that more benefits for the programme had accrued in terms of skills and knowledge development as compared with food security and income improvement of the household.

### **6.3 Extension services on farming households in western Kenya**

In Kenya, as of 2012, 75% of the population was employed within the agriculture sector (World Bank 2013: 3). At the same time, climate change is believed to affect adversely the highly productive lands, representing only 16% of the territory, which are subject to high and medium rainfalls. Those factors threaten rural household's livelihoods, income and food security. Kenya has suffered from 28 droughts over the past hundred years, four of which have occurred during the past ten years. Responding to such scaring drought situations, the government of Kenya proposed variations in the means to help small-scale farmers' pluralism through its Rural Advisory Services (RAS). Among others, it introduced the Swedish International Development Agency (SIDA) funded National Agriculture and Livestock Extension Programme in the year 2000, which lasted until December 2011.

Although the advocacy created confusion among farmers and duplication of efforts, it aimed at uplifting productivity, encouraging commercialization and enhancing resilience through the increased use of agricultural technologies. The programme aimed to improve inputs, using demand-driven and participatory agricultural extension approaches. The programme targeted rural populations engaged in agriculture, livestock and fisheries, with a specific focus on pro-poor and non-discriminatory access to the programme. NALEP covered first the high-potential agro-ecological zones and expanded its coverage in 2007–2008 to all districts in Kenya. NALEP strived to support initiatives at different levels, supporting institutional set-ups, collaboration and networking with other actors (NGOs, private sector, other ministries).

However, assessing the impact of the adoption of technological packages in Kenya's agriculture sector promoted by (NALEP), several observations were taken into consideration. Remarkably, out of 1 000 households surveyed in Lugari in western Kenya, the following were observed, i) programme beneficiaries picked up a set of practices and technologies; ii) treated households increased their fertilizer dosage by at least 24.91%; iii) treated households were more likely to use improved water harvesting techniques; iv) in terms of production, treated households appear to have followed the promoted practices of crop rotation, yet productivity per acre is not affected by the treatment; v) treated households also improved post-harvesting handling and marketing (NALEP 2013: 28).

The National Agriculture and Livestock Extension Programme (NALEP) is seen as a leader in sub-Saharan Africa (SSA) in terms of coverage and participatory methods, yet the programme



has not generated a great deal of academic research. In 2006, a report claimed ‘that 80% of the households part of the program that formed a producer group – called *Common Interest Group* (CIG) by the programme, stated that the introduction of the programme has offered new opportunities for men, women and youth in agriculture’ (NALEP *ibid.*). More than 70% of the farmers interviewed claimed that the NALEP approach had led them to regard farming as a business rather than a way of surviving.

Generally, it was somehow difficult to justify the real socio-economic advantages gained by the small farmer in Kenya. From the findings of the participatory assessments of extension services, results are consistent. Comparing the 1994 Action Aid study and the current situation in the interval of 15 to 20 years ago, most farmers noted a decline in their quality of life and in agricultural productivity as of 2000 (Gautam 2000: 8,9). The poor, in particular, had little access to information. The theory on the ground suggested that, extension cannot be expected to reach every farmer, hence, the need for selectivity and reliance on farmer-to-farmer dissemination was imperative. Currently, it is indicated that poor targeting and a lack of responsiveness are a challenge. Instead of working with representative groups of farmers, the extension workers generally target the better-off and those who can afford the new technologies. Not surprisingly, more of the better-off farmers consider extension advice to be relevant to their needs. Poorer farmers are less satisfied. They want advice on less costly technologies, marketing and diversification, along with information about crops that the wealthier farmers do not grow. Hence, the most direct way to measure impact would have been to relate the supply of extension services to farm productivity. With the data available, the paper could not establish a significant positive impact of the supply of extension services, either on farmer efficiency or on farm productivity.

## **7. CHALLENGES OF AGRICULTURAL EXTENSION SERVICES IN EAST AFRICA**

Overall, the dilemma facing most public extension systems in east Africa is the continuing commitment to technology transfer, and their lack of adequate financial resources. Most governing systems are neither prepared nor able to effectively increase farm income and improve the livelihoods of the rural poor. In addition, these public extension systems lack the necessary resources (especially training and programme funds as well as information and communication technologies) to keep their staff up to date and able to actually carry out more innovative extension program activities in the field.

Other important challenges include:

- Lack of decentralized planning programmes and specific management functions to the district and, where needed, sub-district levels.
- Difficultness to convince national and provincial- or state-level extension directors and senior managers to delegate decision-making authority to more junior staff members at the district and sub-district levels.
- Cases of scheduling, conflicts between schools and other local activities or in some cases local administration and chiefs scheduled meetings at the same time in Kenya and Tanzania.

- Conflict of interest between facilitating agencies on the use of methodology was observed in Tanzania and Uganda, whereby gender balance in (FFS) was predominant in participation of female farmers only in all countries of east Africa.
- Availability, allocation and sustainability of financial resources. (Governments are under great pressure to provide a wide range of different educational, health, and other social services to their citizens.)
- Intense competition among the different ministries for the limited public resources, and the urban population generally has more political influence over resource allocation issues than the rural poor do.
- Largely, across all countries, there was a lack of national-level commitment to the FFS concept, as a result many (FFS) are donor funded in Tanzania.
- Low level of participation and involvement of policy makers from village up to regional level more especially in Tanzania.

## **8. CONCLUDING REMARKS**

Although extension services have significantly served a great deal, the transformations of agricultural system in east Africa, consulted literatures in this study, suggest that it is very difficult to establish a clear relationship between supply of extension services and socio-economic development. Being diverse and dynamic in nature, east Africa is largely characterized by public extension services than the private ones, especially in Tanzania and Uganda.

The Kenyan experience portrays a different picture, whereby together with the government extension scheme, private organizations have greatly occupied the field, operating on a purely profit making set up. This has been seen to be effective and value sensitive in some cases, but regarding the nature and scope of pluralistic farmers in east Africa, affordability to private extensions is limited to a good number of small farmers. For attracting more small farmers to such individual purchasing of extension services, more non-profit making organizations are critically needed to reduce the purely market-based business. However, the emergence of private organizations providing agricultural extension services that are increasing in Tanzania and Uganda, shows that the prospect of a fully fledged market-driven agricultural extension services in east Africa in the next ten or so years is possible.

## **9. RECOMMENDATIONS**

Realizing numerous challenges across all countries of east Africa, for agriculture services to realize its role in economic development of farmers in East Africa, the paper recommends the following:

- There should be extremely more disciplined and proper use of public agricultural incentives/funds. (Responsible officers for extension project, that is, agricultural experts, accountants

and other extension service-related activists in responsible organizations should be audited beyond traditional tendencies on how accurate money was spent but what value for the investment has been brought about.)

- Promotion of a plural approach in extension services by mobilization of farmers association is the best practice model for ensuring full benefits of the target bunch.
- More money should be spent at farmers' level rather than at individual levels.
- Contracting of farmers' extension services from advanced regions should be defined from the grassroots level (farmers' level).
- A sound management structure should be built at national level, for administering and channeling farmers' collected revenues.
- An education curriculum should include agriculture modules as core subjects at both lower level and high levels of schooling.

## NOTES

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