

Extension in Sub-Saharan Africa

Overview and assessment of past and current models, and future prospects

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Extension originally was conceived as a service to “extend” research-based knowledge to the rural sector to improve the lives of farmers. It thus included components of technology transfer, broader rural development goals, management skills, and non-formal education. The traditional view of extension in Africa was very much focused on increasing production, improving yields, training farmers, and transferring technology. Today’s understanding of extension goes beyond technology transfer to facilitation; beyond training to learning, and includes assisting farmer groups to form, dealing with marketing issues, and partnering with a broad range of service providers and other agencies. Agricultural extension can be defined 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 and well-being (Birner, Davis, Pender, Nkonya, Anandajayasekaram, Ekboir, et al., 2006). This can include different governmental agencies (formerly the main actors in extension), non-governmental organizations (NGOs), producer organizations and other farmer organizations, and private sector actors – which include input suppliers, purchasers of agricultural products, training organizations, and media groups (Neuchatel Group, 1999).

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Successes and failures of extension models

Extension impacts per se are very difficult to show, especially in terms of dealing with attribution issues and linking cause and effect quantitatively. Many infrastructural variables and other factors affect agricultural performance in complex and contradictory ways and benefits are difficult to quantify (Anderson, 2007). Baseline data is often missing.

Even though extension has been shown to have significant and positive effects on knowledge, adoption, and productivity. Evenson (1997) reviewed 57 economic impact studies, including seven African countries (the models used were either T&V or not noted). There was a wide range of impact, with regard to awareness, adoption, and productivity. Finally, results showed that the highest payoffs to extension occurred in developing countries that are catching up with industrialized countries and with farmers who have access to schooling, technology, and extension. According to a review by the World Bank in the 1980s and 1990s, three out of five extension projects in Africa were “satisfactory”. T&V was seen as somewhat satisfactory in Kenya and Somalia. T&V in Rwanda and Cote d’Ivoire was deemed unsatisfactory.

T&V in particular, and public extension systems in general, came under attack in the 1980s due to the cost of financing coupled with criticisms of irrelevance, inefficiency, ineffectiveness, and lack of equity (Riviera, 2001). Despite the yield increases, the program was not sustainable, and left many countries saddled with huge debts. T&V has shown to be more successful in Asia, where there is more homogeneity within farming systems and higher capacity among agents and farmers. The T&V system was also more successful in promoting very specific packages (where they were suitable). However, the problem is that a tight

management system and close control of “messages” does not constitute relevance for the clients.

These problems have led to the reforms of many extension systems, including privatization, decentralization, outsourcing, and participatory or demand-driven aspects. Certain of these reforms have been formally and informally evaluated. Problems encountered with decentralized extension included use of extension agents for non-extension purposes, lack of financial sustainability, and difficulties in linking to research (Anderson & Feder, 2004). In general, participatory reforms have been seen as promising, while fee-for service has not been well taken up in the few low-income countries where it has been attempted. However, in general, most extension reforms have yet to be evaluated as to their effectiveness.

Farmer field schools (FFS) have been a recent topic of debate as to their impact in SSA and elsewhere (Davis, 2006; Gallagher, Braun, & Duveskog, in press). Although many positive reports exist on the benefits of the FFS approach, some studies have called into question their overall impact and financial sustainability. FFS have shown remarkable impact in terms of pesticide reduction, increases in productivity, knowledge gain among farmers, and empowerment. However, these effects have been generally confined to the most directly-engaged farmers, rather than demonstrating adequate capacity for scaling up for greater impact. The FFS themselves are undergoing reforms to address these issues, such as becoming self-financed (Khisra, 2007).

Farmer Field Schools

FFS are a participatory method of learning, technology development, and dissemination based on adult-learning principles such as experiential learning. Groups of 20-25 farmers typically meet weekly in an informal setting in their own environment. Farmers are facilitated to conduct their own research, diagnose and test problems, and come up with solutions. Both to ensure sustainability and to enhance the sense of ownership and responsibility, FFS programs are encouraging cost sharing.

Several reviews have been conducted of Ethiopia’s Participatory Demonstration and Training Extension System (PADETES), based on Sasakawa Global 2000’s

(SG-2000) approach to extension that uses demonstration plots and links technologies to inputs through a package deal. Although 55% of respondents used the package, a good number of farmers later abandoned package components such as fertilizer or improved seed (Bekele, Anandajayasekeram, & Kisamba-Mugerwa, 2006). Extension workers saw their role mostly as distributors of fertilizer and credit rather than technical advisors.

After initial (and favourable) qualitative reviews, Benin, Nkonya, Okecho, Pender, Nahdy, Mugarura, et al. (2005) conducted a quantitative assessment of Uganda’s decentralized, market-oriented, farmer-centred National Agricultural Advisory Services (NAADS) in 2005. The study showed that NAADS had positive impacts on farm income and availability and quality of services. However, there was no significant difference in yield growth between NAADS and non-NAADS areas for most crops. At the same time, farmers in the NAADS areas did show less decline in income than in other areas due to adverse climactic conditions during that time. Shortage and timeliness of inputs were other problems in NAADS.

Kenya’s National Agriculture and Livestock Extension Programme (NALEP) was started in 2000. The NALEP approach, supported in part by Sida, focuses on stakeholder inclusion, bottom-up planning, and farmer common interest groups (CIGs) in focal areas. The first phase ran five years, and was evaluated in 2006 (Cueller, Hedland, Mbai, & Mwangi, 2006). Data were collected from project documents and interviews with farmers. The analysis shows that 80% of respondents said that the program offered new opportunities, and 70% said that they viewed farming as a business as a result of NALEP. Regarding sustainability, 70% of respondents claimed that NALEP assisted them to gain profits from their farms.

Finally, a study on the impact of extension in Mozambique showed that public and private extension had a statistically significant positive effect on rural livelihoods (ECON Analysis, 2005). Extension in Mozambique mainly focuses on introducing new varieties, promoting natural pesticides, and promoting commercialization. The study showed that access to extension increased farm production by 8.4%.

Because only 13% of the rural population lived in villages with extension offices, one policy implication was the need to significantly extend coverage (and quality) of extension.

In general, though, problems in extension systems were due to a combination of a lack of relevant technology, failure by research and extension to understand and involve clientele in problem definition and solving, lack of incentives for extension agents, and weak linkages among extension, research, and farmers.

Due to these complications, researchers at the International Food Policy Research Institute put together a framework for designing and analyzing extension (Birner et al. 2006). The framework focuses on

- the design elements of a system of extension governance structures, capacity and management, and advisory methods – and their comparative advantages and disadvantages under different frame conditions;
- performance measurement and quality management in the provision of agricultural advisory services; and
- impact assessment with regard to multiple goals as well as assessment of the costs and the benefits of different ways of providing and financing extension.

The framework – and indeed, this article – call for a move from “best practice” (imported standardized models) to “best fit” where location-specific, participatory, sustainable, “smart” models are used.

Current status of extension in SSA

The failure of many of these extension models to meet their goals effectively, coupled with limited budgets for supporting public extension, has led to the implementation of reforms in most SSA countries. Most African countries today are thus experimenting with reforms to existing extension systems. For instance, Ghana modified their extension system in 2003, based upon a 1997 policy to decentralize (Anderson, 2007). However, such modifications take a long time; hence, there is no information on its success.

Existing models are typically a general or modified T&V model housed in the Ministry of Agriculture, although many countries are using multiple models with pluralistic service providers e.g., Nigeria (Oladele, Koyoma, & Sakagami, 2004). Sasakawa Global 2000 (SG-2000) works closely with extension and is currently working in Ethiopia, Mali, Nigeria, and Uganda. The SG-2000 program first searches for a pool of appropriate technology to be transferred and then works closely with the government using national extension workers.

These reforms are not changing the system used so much as the approaches within the system. Reforms include use of pluralistic extension providers and approaches, decentralization/ devolution, privatization, contracting in and out, cost-sharing, demand-driven/ participatory approaches, fee-for service, and use of information and communication technologies (ICTs). Qamar (2005) has developed a guide for policy makers for reforming extension systems. Several systems provide for competition among extension providers, allowing for great accountability to farmers who can at times both hire and fire them. The NAADS approach has a certain competitive element, as do some FFS, where farmers have power to “fire” the extension agent if they are not pleased with the service.

Many countries are committed to participatory and pluralistic extension systems. How that takes place, however, is another matter. The increasing number of players and stakeholders makes the issues of coordination and regulation crucial, and underlines the need for the government to remain involved in extension. This includes ensuring food security, regulating food quality and safety, and environmental conservation, among others (Rivera & Alex, 2004). According to Sasakawa Global 2000, there are about 150'000 extension workers in Sub-Saharan Africa from the private, public, and civil society sector (see <http://www.saa-tokyo.org/english/safe/index.html>).

It is apparent that little is known about the capacity, quality of service, and performance of extensions systems in SSA. This type of information is urgently needed to assess the strengths, weaknesses, and performance of extension, and to strengthen it to reduce rural poverty and to improve rural livelihoods.

Table 2:
Extension models and numbers of agents in selected SSA countries

Country (Approximate no. of agents where known)	Current Model(s)
Angola	Rural Development and Extension Programme; FFS
Benin	Participatory management approach; decentralized model; FFS
Burkina Faso	FFS
Cameroon	National Agricultural Extension and Research Program Support Project; FFS
Ethiopia (65'000) ¹	Model based on SG-2000 approach: Participatory Demonstration and Training Extension System; FFS
Ghana	Unified Extension System (modified T&V); pluralistic with NGOs and private companies part of the national extension system; decentralized; FFS
Kenya	Pluralistic system including public, private, NGOs; FFS; stakeholder approach (NALEP): sector-wide, focal area, demand-driven, groupbased approach
Malawi	Pluralistic, demand-driven, decentralized; "one village one product;" FFS
Mali	Modified T&V; both private and parastatal services for cotton; FFS; SG2000
Mozambique (1'068)	Government-led pluralistic extension; FFS
Nigeria (5'252)	FFS; participatory; SG-2000
Rwanda (500)	Participative, pluralistic, specialized, bottom-up approach; FFS
Senegal	FFS; government-led demand-driven and pluralistic system; FFS
Tanzania (7'000)	FFS; group-based approach; SG-2000; modified FSRE from Sokoine. University of Agriculture's Centre for Sustainable Rural Development; private extension; decentralized Participatory District Extension; pluralism
Uganda	Pluralistic; National Agricultural Advisory Services (NAADS) is demand-driven, client-oriented, and farmer-led; SG-2000; FFS
Zambia	Participatory Extension Approach; FFS

¹*Ethiopia has dramatically increased the number of extension agents from approximately 15'000 to about 65'000 in the past couple of years as part of a major capacity building effort (Ministry of Agriculture and Rural Development, 2007).*

Innovative extension approaches

Following the above review of the current status of extension in SSA, we move now into details of specific innovative approaches in use in SSA and elsewhere today.

Fee for-service extension is provided for by the public (or another sector) and paid for by the farmers (Anderson & Feder, 2005). Small groups of farmers usually contract the services. This arrangement allows clientele to "vote" on programs and program scale by paying for them (Hanson & Just, 2001). Most of the examples of this model come from developed countries, such as New Zealand, which is completely privatized. Hanson and Just argue that universal paid extension is

not in the public interest, but that there is an optimal mix of public, private, and paid extension. Farmers could be stratified, allowing the commercial farmers to purchase services while smaller, poorer farmers are serviced by public extension.

In Uganda, the government has been implementing the Plan for the Modernization of Agriculture. One component created in 2001 is the NAADS program mentioned above, which has the goal of increasing market-oriented production through empowering farmers to demand and control extension services. NAADS is an innovative public-private extension approach. The main components of NAADS include

decentralization, outsourcing, farmer empowerment, market orientation, and cost-recovery (Anderson, 2007).

Farmer field schools (FFS) were introduced into sub-Saharan Africa in the mid-1990s. They are in place in at least 27 SSA countries (Braun, Jiggins, Roling, van den Berg & Snijders, 2005). FFS came from Asia, where they were developed to promote integrated pest management programs. In Africa, FFS are being used for a variety of activities, including food security, animal husbandry, and soil and water conservation. They are even moving beyond agriculture into health (HIV/AIDS) and other relevant rural topics.

A related concept to FFS is the farmer study circles. Study circles, much more informal than FFS, provide opportunities for group exploration and learning, to gain knowledge on whatever topic members decide. A group of people meet regularly, with no external "expert" (although resource persons may be called in or facilitators may guide the groups). Study circles allow a forum for people to learn and solve their own problems. The Swedish Cooperative Centre focuses on human rights, improved livelihoods, and increased incomes, and has developed at least 68 different study circle guides in SSA for issues ranging from crops to HIV/AIDS (www.sccpor-tal.org).

Other innovative methods are related to the rapidly-expanding information and communications technology sector. Although ICTs are used in extension in countries such as China, India, and Chile, Africa has lagged behind in harnessing ICT potential for extension and other rural development issues. However, some examples exist; for instance, in Kenya and Uganda, mobile phone services provide cheap messages about crop price information via text messaging. In Tanzania, there are "market spies," farmers who visit local markets and remain in contact with the village using mobile phones.

An Indian decentralized market-driven extension model that may provide insights for extension in SSA is the Agricultural Technology Management Agency (ATMA) Model, an attempt to increase farm income and rural employment (Singh, Swanson, & Singh, 2006). ATMA is meant to integrate extension programs across line departments, link research and

extension, and use bottom-up planning procedures. Many judge it as a successful model of extension reform (Anderson, 2007). The authors outline four axioms essential to market-driven extension. These are (a) Don't encourage farmers to produce without a market; (b) Use products that are easily transported; (c) Pay attention to agro-ecological conditions for crops; and (d) Diversify crops to avoid saturation.

There are also several innovative approaches in financing extension services. The creation of a Trust Fund (Ghana) and Basket Funding (Tanzania) allows for the pooling of funds and distribution to end-users based on demand. In both cases, stakeholder forums consisting of farmer groups bring together concerns for required services from either public or private bodies. Under the system, farmers are empowered to identify and use selected qualified service providers (Government of Kenya, 2005). Other potential methods include levies on export commodities, community-driven development funds (Guinea and Kenya), and contracting by the government (Mozambique) (Alex, Byerlee, Helene-Collion, & Rivera, 2004).

Furthermore, financing can come through decentralization, involvement of farmers' associations and NGOs, contracting-out of extension services, public-private partnerships, privatization, and embedding advisory services in other types of contracts (Anderson, 2007). More information can also be found in the Agriculture Investment Sourcebook's Module 3 (World Bank, 2005).

Future prospects for extension in SSA

This paper has shown that there is a wide variety of extension approaches and reforms in SSA today. Different programs have diverse goals and thus differing strengths and weaknesses. For instance, T&V, although financially unsustainable, proved effective in training agents and improving the management of the overall system. The PADETES/SG-2000 type of model in Ethiopia has proved effective in getting large numbers of farmers to adopt technology packages for maize. Farmer field school models have proven very effective at strengthening farmers' capacity and empowering rural people.

Based on the current status of extension in SSA, it appears that pluralism is the future of extension in SSA, with a greater emphasis on demand-driven, participatory programs. Extension will have a greater focus on facilitation and access to markets through farmer group formation and ICTs. See Table 3 for various approaches and where they may work the best. Because of the diversity of approaches (which mirrors the diversity in rural areas), extension agents in SSA (public, private, and civil society) will need special skills that go beyond the basic technical skills. Agents will need skills in group dynamics, marketing, and ICTs. More than ever, he or she will need to be a skilled technician who also is a broker of sorts, being able to connect farmers in their areas to markets and other institutions that are demanded by farmers.

Conclusions

Unfortunately, there is no “best practice” for modifying extension programs, a magic model that can be standardized and implemented anywhere. This has been tried with Integrated Rural Development Programs, training and visit extension, and to a certain extent, farmer field schools. However, there are many good models with useful features that, when implemented in a flexible, participatory, and sustainable (“smart”) way that meets the unique frame conditions of different countries and farming systems, can lead to improved extension performance and positive impact that policymakers are looking for in sub-Saharan Africa. Promising models include the farmer field school approach; the Indian ATMA market-driven approach; and pluralistic, demand-driven models that incorporate the use of information and communication technologies.

It is important to understand the experience of different countries and different extension models to develop and implement more effective models for sub-Saharan Africa countries. But there is very little information in the literature on current models and the number of public, private, and third sector extension agents on the ground. Data are also lacking to show the capacity and performance of various extension systems.

Table 3: Extension approaches and potentials for success

Approach	Where does it work?
Fee-for-service	High potential areas; capable public, private, and civil society providers
T&V	Homogeneous areas; hierarchal and structured systems
NAADS	Available markets and market infrastructure; capable public, private, and civil society providers; decentralized systems; ability of farmers to pay; high social capital
FFS	High social capital; capable extension agents
ATMA	Available markets; capable research, extension, and other technical backstoppers; decentralized system; strong links between line departments PADETES
Hierarchal and structured systems	
ICTs	ICT infrastructure; enabling policy environment (e.g. low taxes on mobile phone usage)
NALEP	High social capital; available markets and market infrastructure