Promoting Sustainable Extension Approaches: Farmer Field School (FFS) and its role in sustainable agricultural development in African.

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Abstract

This paper discusses the concept of Farmer Field School and its role in a multidisciplinary research agenda for sustainable agriculture in Africa. The FFS as a group learning approach builds knowledge and capacity among farmers to enable them diagnose their problems, identify solutions and develop plans and implement them with or without support from outside. The paper suggests that a multidisciplinary research agenda will not only aim at technology development but will also seek ways of stakeholder participation in technology development, validation and dissemination. It concludes that this approach will not increase agricultural productivity; but it will also lead to sustainable agriculture in Africa.

Introduction

Agricultural technology can be defined as any behaviour or practice that involves the interaction of individuals within the production system. From the time farmers decide what to invest in farming until they sell their product, they perform a series of actions that are the product they know and what they think is best. Agricultural professionals such as extensionists, and researchers are also equipped with knowledge that in turn leads them to believe in the effectiveness of particular farm practice or technology. Consequently, those practice and /or behaviours applied by both farmers and agricultural professionals constitute agricultural technologies (CTTA, 1992).

In traditional research and extension linkage system, however, agricultural technology development and transfer (TDT) have tended to be largely based on a vertical one-way communication model with information flowing from research to extension and the role of extension is to transfer the information to the farmers. In many of these linear models, problem definition tended skewed toward research interests than to farmer perceived problems. Research results have often also not been delivered efficiently to extension workers, who most of the time lack the necessary knowledge, skills and resources to motivate farmers to adopt such practices. This liner model also viewed farmers, extensionists and researchers as three separate strata and the links between them have been weak or non-existent.

In the 1950s and 1960s, the emphasis of TDT was on the adoption and non-adoption of technologies without regard to their appropriateness. For example, the work of Rogers in 1963. The common explanation of failures technologies as a result of non-adoption was that farmers were ignorant. The cure was ***more extension teaching*** (Chambers 1983). This strategy divided farmers into innovators and laggards. This categorization is extreme to say the least. But the truth is that when farmers do no adopt they do so because the are wise, and not because they are ignorant (Asiabaka, 1994.)
In the 1970s and early 1980s TDT was typically top-down. Non adoption by farmers was attributed to farm level constraints. The panacea was to ***remove*** the constraints by input supply and introduction of farming systems research (FSR). But during the late 1980s, and early 1990s TDT recognized the central role of farmers. Practitioners started to explain farmers' non-adoption of technologies as stemming from the fact that the technology does not fit. The prescription was the to change the process by ***emphasizing farmer participation***. This approach encourages analysis by farmers and enhance changes in the attitudes of researchers and farmers.

Therefore, TDT needs to be:

- **Participatory:** The process of technology identification, development and transfer must include the views and inputs of farmers in the locality being served.
- **Integrative:** The process of TDT must involve researcher, extension agents, communicators and farmer in a continuous and interactive problems of farmer, use local resources or personnel, equipment and offices in a low-cost manner.
- **Practical:** TDT must focus on actual and immediate problem of farmers, use local resources of personnel, equipment and office in a low-cost manner.

A typical example of participatory extension method is the Farmer School (FFS). The Farmer Field School extension method was introduced in Central Java in Indonesia in 1989, under the assistance provided by Food and Agriculture Organization (FAO) of the United Nations to Indonesia Pest Management (IPM) programme on rice (Matata, et al. 2001). FFS was introduced Kenya in 1995 on a pilot basis under FAO's Special Programme on Food Production (SPFP) for Food Security in Low Income Countries by Villa Marie Enterprises in collaboration with Ministry of Agriculture (MoA) and Kenya Agricultural Research (KARI). FFS was introduced to West Africa also in the Mid 1990s on cassava IPM (Asiabaka and James, 1999, ESCaPP, 1995). FFS is based on the premise that the farmers participating farmers become researchers who test various technological options available, during which process they are able to decide what is the best alternative for adoption in their particular circumstance. FFS as participatory extension methodology recognizes the need to involve farmers in technology development and transfer. In this process, farmers are central in the process of technology development. FFS traing emphasizes building on the farmers' ability to experiment and draw conclusions and it empowers farmers to improve their socio-economic conditions (Asiabaka and James, 1999).

Constraints to Sustainable Agriculture in Africa.

Worldwide, and for thousand of years, agriculture is the activity which is the most essential to human survival and well being (FAO, 1991). It has also been the economic sector which most effects and is most dependent on the natural environment. With the acceleration of demand due to population growth, technological change as well as lack of alternative employment opportunities in rural areas, the conflict between agriculture and the environment has grown (FAO, 1991). With less than 15% of the total population, Africa has until recently about 50% of all food aid meant for the developing countries. The major recipients have been countries of subSaharan African (SSA). The food insecurity in Africa has persisted and a number of factors have impinged on sustainable agriculture in Africa.

According to FAO (1991), sustainable agriculture has been defined as follows:
"… the management and conservation of the natural resource base, and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in agriculture, forestry and fisheries sectors) conserve land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable."

FAO also reports that by 2025, the world will have to feed an additional 3.2 billion people from natural resource base which already seriously threatened by unsustainable farming practices and environmental pressure arising from other human activities. Some of the constraints to sustainable agriculture in Africa are:

(a) **Instability in the Polity**: No development strategy, however important and elaborately carved out, will led to sustainable agriculture in Africa if the countries in the continent have unstable governments and economy. Donors and other investors need guarantee that their investments are safe and are appropriately targeted and used.
(b) **Inappropriate Planning and policies:** A general indictment of Africa countries is that there is lack of realism, continuity and consistency. Their trade mark have been "adhocism" and improvisation. Little attention has been paid to such variables as realistically identified development needs, target beneficiaries, budgetary constraints, potential funding sources,

manpower availability, employment opportunities, population growth rate, environmental sustainability and implications, and global socioeconomic trends (Yaker, 1993). Yaker further pointed out that planning and policy practices have often has a negative impact on various aspects of sustainable food production. For instance, development agenda have invariably ignored the need for grass root and people participation. The have tended to tilt towards the center. Consequently, such plans so not reflect the needs of the beneficiaries. These plans are "top-down" and often are tailor-made from a developed economy that has a different economic, social and political landscape from the African setting which is characterized by poor economy and rain-fed agriculture.

(c) **Environmental Degradation:** It has been reported that only 8% of Africa's soil is found to be on fertile lands, and 92% is on marginal lands, which are largely desert, acidic, saline, or waterlogged (ECA, 1989). Many of these countries are prone to soil erosion, e.g. in Nigeria, and over-grazing as in most countries in East Africa. The depletion of the regions soils and water resources have been compounded by increasing deforestation which has been put at 4 million hectares annually (ECA 1987). The reasons for deforestation include:

* bushfires
* shifting cultivation
* utilization of wood for fuel and construction
* water and wind erosion
* timber exploitation
* industrial use and fish processing.

a) **Lack of appropriate markets:** There is lack of appropriate marketing facilities, e.g. storage, processing, packaging and handling. Transportation in African countries are inefficient and obsolete. FAO (1990) reported that fertilizer losses resulting from poor marketing practices in Africa may reach up to 3-10% or equivalent to about US$5000 million a year.

b) **Lack of mechanization**: According to Hunger Project (1990), 1% of farm power is provided by mechanical means, while 10% comes from animals. Human power accounts for 89%. The implication is that implements used in agriculture are basically primitive and good for only subsistence agriculture.

c) **Inappropriate Research and Development (A&D) Agenda:** Research and Development agenda is often skewed to academic publication for the purpose of promotion and advancement in careers. Often, researchers see themselves as representing their specific disciplines instead of working as team to solve national agricultural problems. The advantage of multidisciplinary research is that each researcher contributes his expertise to the research programme. The beneficiary of such collaboration is the farmer whose problems are solved on the long run.

APPROACHES TO AGRICUTURAL EXTENSION

For research to be effective there must be an efficient mechanism whereby its result can be used by the end users. The process of making available the fruits of research is the function of extension. Extension services frequently have many other tasks to perform, e.g. advising farmers on input availability and sources of agricultural credit. The traditional view of technology transfer is a one-way process. Accordingly, research produces innovations which are passed on to extension which in turn passes them to farmers (Mettrick, 1993). This approach has been describes as "sock-it-to-them" by Roling, (1983) and (ToT) by Chambers (1983).

However, the realization that one cannot think in terms of water-tight compartments of creators, disseminators and users of agricultural knowledge has led to the development of the concept of Agricultural Knowledge and Information Systems (AKIS). Roling (1989) defined AKIS as follows: "a set of agricultural organizations and/or persons and the links and interactions between them, engaged in such process as the generation, transformation, transmission, storage, retrieval, integration, diffusion and utilization of knowledge and information with the purpose of working

synergically to support decision making, problem solving and innovation in a given country's agriculture or a domain thereof"
The AKIS according to Mettrick (1993) also has to be seen as part of a larger system. Thus there external influences which have to be taken into account.

a) **Structural conditions**: markets, inputs/outputs, infrastructure, resource base, etc.
b) **external institutions**: aid donors, international agricultural research centers, commercial farms, etc.
c) **policy environment**: laws, regulations, incentives, customs, etc.
d) **political and bureaucratic structure**: how interest groups affect the system (Elliot, 1987)

The role of extension organization can be to help farmers:

* experiment with new technologies or new farming systems
* gain access to relevant information from variety of information sources
* evaluate and interpret this information for their own situation, and to learn from their experiences.

Development of a network to exchange information is vital because it is necessary to integrate information from researchers, farmers and extension agents to be able to develop technologies that work. It is important to point out that in the past this integration is lacking and has received inadequate attention. But participatory extension methodologies are intended to assist these actors in the research-extension-farmer continuum work together in a learning process where each group learns from each other. Approaches to improving agricultural technology systems, such as Farming Systems Research (FSR) and Training and Visit (T&V) extension system, are efforts to improve AKIS synergy (Roling, 1989).

A number of approaches have been tested, and adopted by countries in Africa to improve the effectiveness and efficiency of the technology dissemination process. Two major approaches of agricultural extension have dominated the landscape of these countries since independence. The quantitative ideas of the sixties was that technology would be develop in the temperate areas and transferred to Africa through the traditional top-down transfer of technology model. This idea did not yield the required dividend and it pave way for the Training and Visit (T&V) model-a highly decentralized, management-oriented approach. The World Bank introduced the T & V model to Africa in the 1980s. By the end of the 1980s, the T & V was used by at least 30 African countries. Despite the funding and promotion by the World Bank, the T & V model has been found to be ineffective, inefficient and unsustainable (Asiabaka and Mwangi, 2001, Anandajayasekeram et al. 2001).

There is need therefore for the promotion of participatory multidisciplinary research where the need for empowerment of the farmer will be paramount. Currently, countries in Africa are searching for participatory, pluralistic, decentralized approaches to service provision to smallscale farmers. There is debate by practitioners on extension privatization, contracting extension, farmer participation and other empowerment models. Participatory extension approaches such as the Farmer Field Schools (FFS) are emerging methodologies for technology validation and dissemination in Africa.

Participatory approaches calls for a shift from the status quo. The salient feature of the new approach is the reversal learning, where research and extension are learning from farmers. The key element in the participatory paradigm are to:

a) put emphasis on **people** rather than **things**.
b) Decentralize
c) Empower
d) Value and work according to the needs of stakeholders
e) Learn from beneficiaries, and
f) Beneficiaries learn from each other.

Locations and roles are reversed, with farms and farmers as being central, instead of research stations, laboratories and scientists. For extension, this means rather than being mere agents for concepts or technologies imposed from outside, they need instead to become catalysts and

facilitators helping communities achieve their defined and perceived goals (Anandajayasekeram et al. 2001). This means learning to interact closely with social groups and communities, becoming better listeners and facilitators in developing a responsive, two-way communication process between the rural communities and service institutions (AGRITEX, 1998)

THE CONCEPT OF FARMER FIELD SCHOOL (FFS)

The Farmer Field School is basically a school without walls. It is a school where:

d) participatory training techniques are used to achieve learning objectives.
e) Learning objectives are not limited to those of the work domain alone, but also include interactive and empowerment domains.
f) The approach is integrated and organized so that participants are not the objects of training but are able to use their experience as the subject of training.
g) Participants share in the control of decision making.

The main features of FFS, according to Anandajayasekeram et al (2001) are:

* Field is primary resource
* Participatory discovery learning process where farmer participation is enhanced.
* Hands-on experience sharing i.e. experience forms and the basis for learning
* Capacity building and empowerment
* Stakeholder ownership on the process, content and knowledge derived.
* Covers entire production cycle or key steps in the management practices of the crop livestock systems.
* Can handle multiple technologies and support services simultaneously.
* It is group-based, with in-built flexibility.
* Curriculum is dictated by the specific production system, and priority problems and the local conditions of the farmer groups.
* If properly implemented, enhances farmer to farmer extension of technologies and information.

STEPS I THE FFS PROCESS

Steps in Establishing FFS (classical approach)

9. Farmer-Run FFS
8. Graduation
7. Field days
6. Follow ups by TOT graduands
5. Establishment of FFS
4. Training of Trainers (TOT)
3. Identification of the FFS site
2. Identification of FFS participants
1. Ground working

THE ROLE OF FFS IN PROMOTING SUSTAINABLE AGRICULTURE

Participatory extension approaches emerged in the late 1980s after it was realized that most technologies developed by researchers alone were inappropriate for small holder farmers (Jurgen et al. 2000). Extension services, initially have often been structure and operated on the assumption that farmers are largely passive, and that they are illiterate and therefore ignorant, and they are unable to innovate or to integrate new cropping and livestock practices into their established agricultural systems. (CTA, 1997). In participatory extension, farmers take part in the design, determine management conditions and implement and evaluate the experiments (Chamber, 1989). A successful technology is one which is adopted by its target groups (Werner, 1993).

Jurgen et al. (2000) give the following characteristics of participatory extension approaches:

* They integrate community mobilization for planning and action with rural development, agricultural extension and research.
* They are based on equal partnership between farmers, researchers and extension agents who learn from each other and contribute their knowledge and skills.
* They aim to strengthen rural people problem-solving, planning and management abilities.
* They encourage small holder farmers to learn through experimentation, building on their own knowledge and practices and blending them with new ideas.
* They recognize that communities are not homogenous but consist of various social groups with conflicts and different interests, power and capabilities. The goal is to achieve equitable and sustainable development through negotiation of interests among these groups and by providing space for the poor and marginalized in collective decision making.

According to Farrington and Martin (1988), strong farmer participation is essential if farmer goals and problems are to be identified properly. A very important purpose of participatory approaches is the empowerment of the farmers and other resource-poor. Farmer participation in technology development increases adoption. Evidence from Philippines indicate that farmers were involved in breeding high yielding variety of rice and as a result of such collaboration between farmers and researchers farmers developed their own high yielding variety and thus enhanced the farmers' experimental knowledge and skills. In Kenya Agricultural Research Institute (KARI) used multisiciplinary research teams to develop promising soil management technologies (Mureithi, 2001). These promising technologies were validated and disseminated through Farmer Field School (FFS) approach. In West Africa (Benin, Cameroon, Ghana and Nigeria), a multi-disciplinary research team disciplinary research team diagnosed cassava plant protection technologies and developed low-input cassava plant protection technologies. These were upscaled and disseminated to farmers in the sub-region.

It is vital to note that no amount of research will lead to sustainable agricultural development if the countries in Africa do not address the constraints to sustainable agriculture listed above. Most importantly, they have to use an extension strategy that allows the stakeholder to be part of the research agenda. When the stakeholders to agricultural research are part of the planning and implementation, they have the sense of belonging and ownership. The use of FFS extension approach will make the farmer to be central to agricultural research and dissemination. Multidisciplinary research teams bring into the research agenda scientists from different backgrounds. These differences in background will not only assist in problem solving, but will help in making research more relevant to the needs of the farmers and other users. Farmer Field School as a model will be the most appropriate methodology for validation and dissemination of agricultural technologies. This will lead to people-oriented and sustainable agriculture in Africa.

REFERENCES

Anandajayasekeram, P., A. M. Mweri, O.J. Zishirir, W. Odogola, M. Mkuchu and M phiri 2001 Farmer Field Schools: Synthesis of Experiences and Lessons from FARMESA member Countries. Harare, Zimbabwe: FARMESA.

Asiabaka, C.C. and B.B. James 1999. Farmer Field Schools for Participatory cassava IPM Technology Development in West Africa. In Renard, G. et. al (eds). Farmers and Scientists in a changing environment: Assessing research in West Africa. Weikersheim, Germany: Margrat Verlag.

Asiabaka, C.C. and J.G Mwangi 2001. Strategies for effective Extension Services in Africa: Lessons from Kenya Paper presented at the Association of Third World Scientists, Njoro, Kenya: Egerton University.

Asiabaka, C.C. 1994. the Rate of Adoption of Yam Minisett Technology among farmers in Imo State Nigeria. Final report, International Foundation for Science (IFS) Stockholm, Sweden.

CTTA. 1992: A method for transferring Technologies to farmers. Washington, D.C.: Academy for Educational Development.

CTA 1997. Extension Services: Masters or Servants? Spore Newsletter, NO.68
Chamber, R. 1983. Rural Development: Putting the Last First London: Longman
Economic Commission for Africa (ECA) 1989. The situation of food and agriculture in Africa. Addis Ababa, Ethopia: ECA.

Eliot, H. 1987. Diagnosing constraints in agricultural technology management systems Paper presented at the international workshop on agricultural research management. The Hague: ISNAR.

Ecologically Sustainable Cassava Plant Protection (ESCaPP). 1995. Plant Management Division, International Institute of Tropical Agriculture (IITA), Cotonou, Benin
Food and Agriculture Organisation (FAO) 1990. Fertilizer packaging in developing countries. Rome: FAO.

FAO. 1991 The den Bosch declaration and agenda for action on sustainable agriculture and Rural development. Proceedings of FAO/Netherlands Conference of Agriculture and The Environment. S-Hertogenbosch, the Netherlands, 15-19 April, 1991.

Farrington, J and Martin, A. 1988 Farmer Participation in Agricultural Research: A review of Concepts and Practices, London: ODA.

Hunger project, 1990. Tools of the Trade: Do farmers have the right ones?
African Farmer, 5: 5-13
Jurgen, H., Murwira, K and Connolly, M. 2000 learning Together Through participatory Extension. Harare, Zimbabwe: AGRITEX

Matata, J.B. Anadajayakeram, P, T.N. Kiriro, T. wandera and J. Dixon, 2001. Farming Systems Approach to Technology Development and Transfer Harare, Zimbabwe: FARMESA.

Mettrick H. 1993 Development Oriented Research in Agriculture: An ICRA Textbook Wageningen, The Netherlands: International Centre for Development Oriented Agriculture.

Mureithi, J.G. and J.G. and E. Njue 2001. Farmer Participatory Research proceeding of a methodology Workshop. Nanynki, Kenya: KARI-Rockefeller Foundation, 5-6 June, 1997.
Werner, J. 1993. Participatory Development of agricultural innovations, procedures and methods. GTZ, Germany
Yaker, L. 1993. Constraints and opportunities for Sustainable food production in Sub-Saharan Africa. Keynote paper presented ar a symposium on sustainable food production in subsaharan Africa, IITA, Ibadan, Nigeria, December 7-9, 1992