BRIDGING THE GAP BETWEEN EXTENSION-RESEARCH THROUGH ON-FARM ADAPTIVE RESEARCH (OFAR) PHILOSOPHY

Stephen K. Subair

Department of Agricultural Education and Extension
University of Botswana
Botswana College of Agriculture
Gaborone, Botswana
Phone: +267 3650105    Fax: +267 328753
E-mail: ssubair@temo.BCA.BW

Abstract

A huge body of technology information is available at almost all the Research stations and Universities in Africa. However, the adoption of these technologies has been very slow and selective. In most cases, farmers pick out only one or two elements from a multi-component package, thereby losing the advantages of technical complementarity. This paper proposes that the Research-Extension-Farmer links can be strengthened through the On-Farm Adaptive Research Philosophy (OFAR) comprising of the Diagnostic phase, Field test phase, and the Demonstration phase. The institutional framework for operating the OFAR philosophy, especially in the Southern Africa Developing Countries (SADC,) are discussed.
Introduction

Most of the African countries, as in many developing countries, can boast of many Research Institutes in their respective countries. These Agricultural Institutions, together with their Universities, have developed a huge body of technological information and know how, which, when put into practices on the farms of the Institutions might lead to significant increases in Agricultural productivity. Creditable as this may be, only a very insignificant fraction of the teeming millions of the peasant farming population adopt the available technologies. Where they do, the adoption has been slow and selective, the farmer picking out only one or two elements from a multi-component package tend to lose the advantage of technical complementarity. There is also empirical evidence of wide performance gaps between results in research farms and farmer’s fields under farmer management (Oputa1984). It is not known for sure by how much such performance gaps could be reduced if the farmer’s fields were researcher managed.

In any case, what is of particular concern is the low rate of adoption of recommendations by peasant farmers. This has spurred up the introduction of farming systems research, which aims at tackling all the factors involved in farming systems and their inter-relationships. The complexities of such systems are mind boggling, and, although the concept has received sophisticated scholarly treatments, it is in practice very vague and unlikely to hit the mark. Perhaps a more pragmatic approach is one that focuses attention directly on the constraints (and opportunities) of a given ecological niche and designs appropriate technologies to solve the problem.

Reasons For Slow Adoption of Improved Technologies By Some Farmers

The adoption studies, according to Abalu, 1984, clearly demonstrated that small farmers selectively adopt improved technologies and adapt them to their specific environmental and economic conditions. With this foundation, adoption studies now need to proceed a step further to probe below the statistical patterns of behavior to determine the criteria farmers use when deciding to adopt, adapt, or reject technologies or specific components of recommended technological packages. This type of research, which tends to determine the reasons behind adoption behavior, can be an important aspect of adaptive research. It generates the information necessary to help scientists define relevant research priorities and programmes, to target and fine-tune technologies to local conditions, and to develop effective processes of promotion and dissemination of improved technologies.

In the vast majority of cases, there is a rational reason why small-farmers reject improved technologies or components of technology packages. In some cases, the introduced technology, while biologically superior to local technologies, may not be economically superior to local technologies, especially when one considers the significant variation in the environmental conditions or the resource and factor endowments of individual farms. For example, analysis of economic returns to the technology package recommended in the Puebla project in Mexico showed that the lower levels of fertilizer application most widely adopted by farmers were more profitable than the recommended levels, which were designed to maximize yields, not necessarily returns (Winkelmann,1976). The analysis also
demonstrated that farmers’ rejection of recommended planting density was justified because in average years the recommended density gave no significant increase in economic returns and in poor years resulted in lower yields due to greater drought stress.

In other situations, the differential rate of adoption of recommended technology by small-farmers is most easily explained by variations in the environmental conditions under which they are working. Small-farmers often work in marginal environments marked by highly diverse micro-level agro-ecological zones.

Diverse economic conditions among small-farm householders in terms of resource endowments and availability of the factors of production is also a factor of critical importance in determining differential rates of adoption of new technologies and recommended practices (Merril-Sands 1983). It is also probably the factor most frequently overlooked in the analysis of differential patterns of adoption of introduced technologies by small-farmers of a given region. However, adoption of other recommended practices, which evolved as communication between scientists and farmers, developed, was quite high. For example, two low cost and effective seed management practices were adopted by more than 50 percent of the Puebla (Mexico) farmers. These were diffused light storage techniques, which was developed in response to farmers’ expressed need for reduced storage losses and improved methods for selecting healthy seeds. (Rhodes and Booth, 1982). Over half of the farmers also adopted insect control measures that had the highest returns for cash invested (Horton,1984).

**Strengthening Research – Extension – Farmers Links through the OFAR Philosophy**

The OFAR concept rests on three pillars, namely, full participation by farmers, direct contact between researchers and farmers, and concerted multi-disciplinary investigation of farmers situation. By this we mean that the farmers are given the opportunity to articulate their felt needs. Only when technologies are fashioned around the farmers needs can they become relevant, appropriate and adoptable. The researchers communicating directly with the farmers, on their farms is likely to have a more holistic perception of the farmers circumstances than when they do through the intermediary of an extension worker. The adoption of a new technology depends not only on the technical efficiency of an agronomic practice but also on socio-economic factors, - a fact which calls for concerted action of scientists of different fields. (See fig. 1 appended.). The characteristic features of the OFAR process suggested by the author for improving research-extension-farmers linkage are as follows

1. **Diagnostic Survey Phase**

   Research scientists usually an agronomist, soil scientist, economist, rural sociologist (and other disciplines depending on the nature of the farming system) together with the farmer identify the constraints which limit output. At the end of the survey, the constraints are ranked and those considered to be of high priority are chosen. Existing technologies are critically evaluated with a view to selecting those with potential solutions.
2. **Research Phase**: This phase can be by-passed where potential solutions exist.

3. **Field Test Phase**

   Simple designs and layouts that would not confuse the farmer are used. The essence is for the farmer to easily evaluate the new technology in terms of whether it can, among other things, enhance not only physical productivity but also socio-economic profitability. If the new technology is acceptable, the next logical action is to sell it to a larger farmer audience through demonstration. If it is unacceptable, it is either rejected outright or modified and tried again.

4. **Demonstration Phase**

   The OFAR field test phase is in itself an extension strategy but the demonstration of an accepted technology in the OFAR scheme represents the very hallmark of extension. This demonstration is effected through the Extension Service network where they exist. During the demonstration, the adoption rate is monitored and evaluated. The monitoring/evaluation would give the signal whether all is well, or whether there is still some need for further refinement of the technology. (See Fig.1 appended). If all is well, it is my opinion that farmers will adopt any technology arising from this process very quickly, simply because they were carried on board during the entire process.

**Institutional Framework for Operating the OFAR Philosophy in South African Development Countries (SADC).**

In operating the OFAR Philosophy in SADC region, there is the need to have a very strong link between the Agricultural Research Institutes and the Extension Systems of each of the SADC countries. Participation and involvement of farmers in the above link is also essential. Farmers could be selected through the existing group/unions of various crop/animal commodities in the chiefdoms of SADC countries.

Presently in most of the SADC countries, the Research-Extension-Farmer linkages have been characterized by top-down approaches. In this top-down approaches, ideas methods and technologies have been typically conceived and developed centrally in Research Institutes and then transferred through the Extension system to the farmers. This has resulted in lack of farmers’ enthusiasm in adopting the technologies developed because the end-users (farmers) were never consulted in the process before the development of the technologies.

The solution to this problem lies in using the latest system of bottom-up approaches that encourages the involvement of rural farmers in the process of technology generation and development. This process ensures that rural farmers’ community resources, attitudes and skills (etc) are taken into consideration in the diagnostic process. This in turn will evoke a more positive response and greater commitment on the part of the farmers. In addition, this
approach creates an attitude of “client demand” in which the target audience (farmers) would be highly motivated to adopt the technologies arising from OFAR process using the bottom up approach.

Strategies for Applying OFAR Process by Bottom-Up Approach in the Research Extension-Farmer Link

It is suggested by the author that the application of the OFAR process by the bottom-up approach should involve four actors, namely the Researchers, the Extension staff, the chiefdom farmers group, and the individual farmer.

The farmers within a chiefdom should be organized to form a group based on the crop they plant. This activity should be performed with the help of the Extension Staff allocated to that Chiefdom with the assistance of the local chiefs and local leaders. The extension method to be used should involve “group discussion”. During the group discussion a wide range of problems affecting the farmers might have been collated and prioritized, a meeting involving the researchers, the extension workers and the chiefdom farmers’ group should be called by the extension workers. In this meeting, the collated and prioritized list of farmers’ problems would be discussed in detail. The researchers and the extension workers should then identify local ideas from the farmers for improving the problems.

Efforts could then be made to try and identify existing successful technologies geared towards solving the problems. If successful technologies are available for some of the problems, the comments and ideas of the farmers as well as the information from researchers and the experiences of the extension worker would be combined into a number of simple on-farm experiments. The individual farmer within the group would be given the opportunity to conduct the on-farm experiment under the supervision and advice of the extension staff. The results of the experiments by individual farmer should be discussed at a later meeting to be held by all the actors to discuss the strengths and weaknesses of the on-farm experiment.

Farmers could then be asked to rate the outcome of the experiment and to justify their ratings. If the ratings are high and the reasons advanced are genuine, then the innovation can be continued on a larger scale by the farmers. The improved farm output would be enough to convince the on-lookers to seek information from their colleagues, thus enhancing the aim of achieving a wide spread adoption of the innovation.

If however there are no existing technologies to address some of the problems identified, the researchers and the extension officers, in consultation with the farmers, should work towards the acquisition of appropriate technologies to solve the problems. The role of the farmers and the extension staff would then be to identify local needs, attitudes, knowledge, aspirations and skill levels of farmers that are relevant to the desired technologies. It is hoped that technologies generated by this process would be easily adopted and used by the farmers. The researchers should consider the recommendations of the farmers and the extension workers on the attitudinal variables and build them into the envisaged technology.
Conclusion

An effective Agricultural Extension System has much role to play in attaining self-sufficiency in food production. Agricultural extension has proved effective in several Asian countries for attaining self-sufficiency in food production. The several extension systems that have been tried out in SADC countries have not done much to increase food production from rural farmers who have continued to produce the bulk of the nation’s food. There is therefore the need to consider the OFAR bottom-up approach suggested in this paper as a policy option. It is hoped that if this system is introduced, it will go a long way towards increasing food production in SADC countries. The model provided in figure 1 explains the interactions among the main actors of technology generation dissemination and use i.e. the Researchers, Extension workers and the farmers.

References


