

LINKING INSTITUTIONAL RESEARCH AND EXTENSION TO INDIGENOUS
KNOWLEDGE SYSTEMS: EXPERIENCE FROM THE UMADEP PROJECT
AT SOKOINE UNIVERSITY OF AGRICULTURE (SUA)

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Abstract

This paper seeks to describe ways in which the power, resources and expertise of agricultural research and extension institutions can be made to complement the wisdom, resourcefulness and determination of small-scale farmers to improve their socio-economic conditions. These suggestions are based on the experiences of the Uluguru Mountains Agricultural Development Project (UMADEP) based in the Faculty of Agriculture at SUA and implemented in collaboration with the government extension system and the farmers in Mgeta and Mkuyuni divisions. The paper argues that it is logical to link institutional and indigenous knowledge systems since institutional research and extension are supposed to be getting closer to the users' concrete applications, while indigenous knowledge is becoming more universal and transmittable. The paper highlights the problems experienced in merging the two systems together and stresses the necessity of a communication channel between the two.

Introduction

Much criticisms have been levelled against institutional research and extension as having had little success in generating and disseminating agricultural technologies which are widely adopted by small scale, resource-poor farmers. It is argued that many "improved" technologies although technically sound, are not even appropriate to the agro-climatic conditions. According to Byerlee, *et al.*, (1980),

Clearly farmers reject technologies not because they are conservative or ignorant, but because they rationally weigh the changes in incomes and risk associated with the given technologies under their natural and economic circumstance and decide that for them the technology does not pay.

One of the solutions which has been proposed to redress this weakness is for institutional research and extension to work more closely with farmers. This is based on the acknowledgement of the central role of the farmer in the whole process of technology generation, dissemination and adoption. Thus, approaches like Farming Systems Research (Collinson, 1984) and its variants, Farmer Participatory Research (Farrington and Martin, 1988) and Participatory Technology Development (Waters-Bayer, 1989), have been developed as a way of involving the farmers more closely in the whole process. But despite the recognition of the critical role of farmers in the agricultural development process and despite various approaches which have evolved, there still exists a lot of skepticism about the role farmers can play in the research and extension process, and much ignorance about how farmers may actually participate in this process.

This paper seeks to describe ways in which the power, resources and expertise of agricultural research and extension institutions can be complemented with the wisdom, resourcesfulness and determination of small-scale farmers in order improve their socio-economic conditions. These suggestions are based on the experiences of the Uluguru Mountains Agricultural Development Project (UMADEP) which is a research and extension project based in the Faculty of Agriculture at SUA and implemented in collaboration with the government extension system and the farmers in Mgeta and Mkuyuni Divisions.

Why should Farmers Be Involved?

There are several reasons why farmers should be involved in the technology generation and dissemination process. Among them are:

- (a) Farmers are the final decision-makers, as to whether to adopt or reject a technology. Involving them will improve the chances of the technologies being adopted.
- (b) Farmers are the ones who bear the risk of any new technology, thus, they should have a 'voice' in the development of the technology.
- (c) Farmers are much more likely to pay attention to a new technology if they see that their fellow farmers are actively involved, somehow. Such a technology is less likely to be seen as alien to the farmers and as such, it is likely to diffuse faster within the community and even to other communities
- (d) A fundamental reason for farmers involvement is that it offers an opportunity for co-operation in the mobilization of indigenous knowledge. Farmers have superior knowledge in matters like (Richards 1985; Chambers, 1983):
 - the complexity of their farming systems and the rationale for this complexity
 - the socio-cultural milieu, including available resources and expertise in local agricultural production.
 - the physical environment, including climate, soils, water and vegetation under which agricultural production has to take place.

Why is Indigenous Knowledge Important for Institutional Research and Extension?

Originally indigenous knowledge was equated with "local" or "traditional" knowledge implying a static pool of knowledge which has been handed down from

generation to generation. But it is now realised that farmers are constantly engaged in the process of active innovation and invention, and are constantly reworking and updating their knowledge in light of new challenges and encounters with new forms of knowledge (Richards, 1988, 1985). This implies that,

- (a) farmers have the capacity to take actions to improve their farming system, with or without the assistance of institutional research and extension.
- (b) farmers' indigenous knowledge is dynamic and ever-changing, something created by farmers as part of their changing local environments. Farmers will therefore always fall back to their indigenous knowledge whenever the merits of new technologies are not obvious.
- (c) farmers will accept new knowledge, and modify their indigenous knowledge where new challenges or conditions render their indigenous knowledge irrelevant or inadequate. Farmers are thus open to changes, and are not as conservative as they are sometimes made out to be, by institutional researchers and extension workers.

It is obvious therefore, that farmers will place any new knowledge within the context of their indigenous knowledge, in deciding whether or not to adopt an innovation. Ki-Zebro, (1992), uses the terms "exogenous" and "endogenous" to describe modern scientific and indigenous knowledge respectively and argues that only when farmers are able to combine "exogenous" and "endogenous" knowledge, can permanent change take place in the society. According to him, any development effort must start from, and recognise the local capacities of the local people, rather than relying exclusively on modern scientific knowledge. In order to have any impact, institutional research and extension must therefore start from and build upon the indigenous knowledge of the farmers.

How can Farmers' Input into the Research and Process be Ensured?

The experiences of the Uluguru Mountain Agricultural Development Project (UMADEP) serve to illustrate some of the techniques which can be used to ensure farmers' input into the research and extension process. The farmers' in Mgeta ward of Morogoro Region where this project initially started, have grown and depended on horticultural products for several decades. They have developed a fairly complex farming system adapted to the mountainous terrain they farm, including an elaborate system of terracing and furrow irrigation. However, despite the high degree of intensification of the agricultural system, farmers are faced with a number of important constraints which have limited the possibilities for an improvement in the productivity of the system, and have even threatened the sustainability of the system (Lassalle and Mattee 1994). The UMADEP project sought to build on the farmers' knowledge and skills based on their long experience in mountain agriculture, in developing appropriate innovations which can improve the agricultural productivity of the Mgeta farming systems.

The approach of the project is to link together researchers based at SUA, government extension workers in the Ministry of Agriculture and farmers in a common endeavour of identifying priority problems and seeking for solutions to those problems. A number of strategies were used in this approach.

Participatory Rural Appraisal (PRA)

PRA was one of the initial activities which was undertaken in the project villages. This was undertaken with three basic aims.

- (i) to create cohesiveness between the SUA researchers, government extension workers and farmers.
- (ii) to involve farmers in the process of internal reflection so as to analyse their reality in terms of the existing socio-economic conditions and the underlying factors.

- (iii) to identify priorities and problems which need attention from the researchers, extension workers and the farmers themselves.

Although the technique has succeeded in achieving all the three objectives, it has also presented a number of lessons (Chonya *et al.* forthcoming)

- It is necessary to be clear from the beginning about the objectives of carrying out the PRA. Farmers in particular must be made to understand that the PRA is only the beginning of a long-term collaborative process whereby after identifying priority problems, they must continue to participate to work for the solutions.
- The technique demands the right skills and attitudes on the part of institutional researchers and extension workers, who must be able and willing to use various ways of tapping the knowledge and experience of farmers concerning the local environment.
- Results of PRA are very location-specific, and are hardly transferrable to other locations. There must be adequate time and resources to carry out PRAs in the various locations where intervention is intended.
- In order to have maximum input from the farmers, the media to be used are critical. Farmers must be allowed to express themselves in the various ways they feel comfortable in. For example, in the UMADEP project, roleplay, drama, pictures, drawing, comics and sketches are used to facilitate access to information by both the literate and illiterate.
- PRA is one of the most effective techniques to build team spirit amongst professionals of different disciplines, and to establish rapport with farmers of a particular location.

The use of Farmers Groups

Farmers' groups have been used in various areas to facilitate research/extension/ farmer interaction (Norman *et al.*, 1988; Masihara *et al.*, 1988; Modiakgotla, 1990). Within the UMADEP project, farmers' groups are instrumental in facilitating dialogue between farmers and professionals, in the process of articulating farmers needs, problems and interest and in designing programmes to solve problems (Mattee and Lassale, 1994). Once the village situation has been analysed and described, and priorities set, the researchers and extension workers work with existing and emergent groups to undertake various activities which will solve their priority problems. So far more than 15 farmers' groups have been formed, based on different interests of the farmers. These include vegetable growers co-operative societies, fruit tree nursery owners association, dairy goat keepers association, and savings and credit societies.

In order to further share experiences amongst farmers, and to increase their collective capacities, farmers' groups have formed networks amongst themselves. These networks are at the local level (e.g. Mgeta Division) as well as at the national level, where the various local networks have federated themselves into the Farmers' Groups Network in Tanzania or "*Mtandao wa Vikundi vya Wakulima Tanzania*" (MVIWATA) in Kiswahili, with the objectives of exchanging ideas and experiences, and disseminating solutions, reports and recommendations about those ideas and experiences to all concerned (Gilla, 1993).

Experiences of the project with farmers' groups and their networks, have shown to be very effective in:

- facilitating communication between institutional researchers and extension workers on one side, and farmers on the other,
- facilitating communication amongst farmers themselves, including within communities, as well as between communities. A process of sharing knowledge and experiences is thus created,
- facilitating the creation of dynamism and a momentum for action on those

programmes which have been agreed upon by group consensus, and as such this has resulted in concrete actions being taken by farmers.

However, to effectively work with farmers' groups, professionals need to:

- establish mutual respect and confidence between farmers and themselves. Experience has shown that this relationship will be built over a period of time, through regular contacts with farmers, and engaging in certain concrete activities which demonstrate the professionals' ability and concern for the farmers (Lassalle, *et al.*, 1990)
- play a facilitating rather than a leadership role in working with these groups. In order to facilitate the emergence of genuine farmers' groups, the independence of these groups must be respected, and the professionals must recognize these groups as independent centres of decision-making. The role of the professionals in training and guidance of the group members is crucial. Training is always based on the actual situation, and so is conducted in the village, on farmers' or demonstration plots, and the farmers are encouraged to share their experiences in various ways such as role playing, drama, farmers' exchanges and group discussions (Noy, 1990).
- accept the increase in farmers' power which will be brought by strengthening and networking of farmers' groups. By acting together, farmers are likely to be more confident in influencing the decisions of professionals on matters which have a bearing on their welfare. While local groups will be more concerned with practical matters related to agricultural production, for example, the availability of inputs, and agricultural technologies, the national network is likely to look more at policy issues of marketing, pricing and land tenure.

Trial and Demonstration Plots

One of the decisions which have been made by some of the farmers' group together with the researchers and extension workers is on the type of technologies to be tested

for subsequent adoption on farmers' fields. A trial and demonstration plot was therefore established in one of the villages. The plot reflected the natural conditions of the area, and the management of the plot is undertaken jointly by farmers and the extension workers. Some of the technologies which were tested on the plot include the proper husbandry practices for tomatoes and a local vegetable (commonly known as "mnavu"), appropriate fruit tree propagation techniques, progressive terracing with the establishment of sugar cane strips (Mgumia, 1993) and other soil conservation techniques.

On the trial and demonstration plot, farmers are continuously involved in assessing the technologies at all stages. The role of the researchers is to provide information and the necessary inputs, to assist in the design, monitoring and evaluation of the results. Thus, the primary objective for the researchers is not the generation of statistical data *per se*, but to assist farmers and the extension workers in evaluating potential technologies.

It is important to note that in the process of technology evaluation, the inputs of the professional and the farmers are equally important, and must be given equal weight. Two examples may help to illustrate this. In one of the instances, the researchers tried to introduce wheat as a possible replacement crop for maize which takes a very long time to mature because of the cool environment. While this made technical sense, the idea had to be abandoned after a few seasons because the farmers were not willing to substitute maize for wheat in their diets. However, in another case, farmers had been very skeptical to try tomatoes, because according to their experiences tomatoes always succumbed to late blight, and so they believed that tomatoes could not be grown in Mgeta area. The researchers were able to demonstrate that through appropriate timing and proper management practices, tomatoes can be profitably grown in the area. Eventually, the farmers were convinced, and tomatoes are now being widely grown, and in fact, they are about to become the second most important cash crop in the area after cabbages.

The trial and demonstration plot serves as a place for joint experimentation by researchers, extension workers and farmers. It is used not only as a technique to generate information, but also to draw the farmers into the process of knowledge creation, control and utilization.

Strengthening communication between professionals, Farmers and Policy-makers

In order to increase the capacities of the institutions to work more closely with small farmers, a group of researchers within SUA started working together as a think tank to try to monitor, systematize and further refine the various techniques of linking researchers, extension workers, and farmers. The motto of the group is "Universities and Rural Communities: Let us Learn From Each Other" (SCOM, 1991).

As part of its activities, the group has organized a number of meetings and workshops which brought together representatives of farmers' groups, SUA academics and government policy-makers to discuss ways and means of forging a closer working relationship. Through such meetings and workshops, the farmers' voice is better heard, and researchers and extension workers become more sensitive to the needs and concerns of the farmers in their professional activities. Also, through participation in such workshops, farmers' self-confidence and astuteness in dealing with professionals is increased.

The experiences of the "Strengthening Communication" group so far indicate that, in general the internal structure and the reward system in the university are such that they do not facilitate or encourage researchers to work more closely with rural communities (Mattee, 1993).

Students Field Practicals

Students have been involved in the UMADEP project by undertaking their field practical training in the project area. Their participation consisted of each student being hosted by a farm family for one month, during each time the student participates in all the agricultural activities in the family. Through participant observation and

constant dialogue with the farm family, the student is able to analyse the situation of the farmer, including describing the system, identifying the strengths and weakness of the system and proposing solutions to improve the farm. The student prepares a detailed report in Kiswahili which is reviewed and discussed with the family, in order to come to an agreement.

This technique has helped very much in:

- bringing the students and farmers physically and psychologically closer
- enabling the students to learn directly from farmers based on their long experiences with the local farming system, and likewise enabling the farmers to learn some modern knowledge from the students
- giving the students a practical and realistic prospective to small-holder agriculture
- giving an opportunity to the students to improve on their classroom learning in light of practical experiences.

However, where many students are involved, practical difficulties of assigning them to farm families will arise, especially if they all have to go to the same location.

Establishment of Outreach Stations

Traditionally, outreach stations have been established by major research centres to facilitate research in different agro-ecological zones, particularly adaptive, on-farm type of research. However, such stations have not necessarily resulted in higher involvement of farmers in the research process. In the UMADEP project an attempt is being made to establish an outreach station which will not only facilitate research and extension, but will also facilitate the participation of farmers in this process. Facilities are therefore being established in Mgeta with the following purpose:

- (a) to provide accommodation to SUA staff, students and government officials whenever they need to go and work in the villages, as well as whenever they need a place for quiet reflection
- (b) to provide accommodation to those farmers who will be visiting the area from other distant places
- (c) to provide facilities for holding meetings, workshops, seminars or cultural programmes either by SUA staff and students or any other outside group, as well as by the local farmers themselves, and
- (d) to provide office facilities to facilitate co-ordination between and amongst the different farmers' groups, SUA researchers, government extension workers and other interested parties.

The facilities which will be called the Mgeta House of Agriculture will be owned by SUA, but will be managed jointly by SUA and the farmers in the area. It is hoped that through such facilities, SUA researchers and students will be closer to the farmers, while farmers will find it easier to participate in the various research and extension activities. The psychological barriers between professionals on the one hand and farmers on the other are also likely to be reduced. Nevertheless, the issues of how to sustain the activities of such an outreach station and how to take care of other agro-ecological zones will need to be addressed sooner rather than later.

Conclusion

It would seem logical to link institutional and indigenous knowledge systems, since institutional research and extension are supposed to be getting closer to the users' concrete applications, while indigenous knowledge is becoming more universal and transmittable. However, resistance from both sides is not easy to overcome. Conservative behaviour can be observed from both sides and the conditions to merge the two systems are still vague.

The actors of the process, researchers, extension workers and farmers, must first of all be convinced of the necessity of a communication channel among them. This will have to be as a result of regular and sustained contact and collaboration. However,

such contact should avoid the romance of a lonely researcher gleaning here and there for indigenous knowledge from some white-haired elders and publishing it in an obscure journal only read by its own editorial committee. Both institutional and indigenous knowledge are generated over a long period of time. The linkage between these two systems must therefore be based on long term relationships. The UMADEP project has tried to use different methods for creating and sustaining such long term relationships. Still there are some issues that need to be addressed in order to sustain and institutionalize the approach.

What will happen to “mainstream” research?

Institutional research is generally associated with the very noble aim of expanding the frontiers of knowledge and characterized by a high degree of freedom to the researcher to determine the research agenda. On the other hand, this freedom is in reality defined by sponsors - governments, international research agencies, private companies, non governmental organisations, etc. Each of them sets conditions for financial support and therefore substantially influences the “researchers’ freedom”. One may therefore ask, shouldn’t farmers also influence the research agenda since this research is presumably aimed at solving their problems? Mainstream research cannot ignore the context in which it is funded and executed. So, how can researchers be more conscious of the farmers’ needs and priorities when setting research agenda?

How to synthesise, systematise and share farmers' indigenous knowledge?

Most of the institutional researchers and extension workers lack the skills to synthesise, systematise and share indigenous knowledge. Interfaces between indigenous knowledge and institutional research include oral transmission such as roleplays and drama as well as visual media such as drawings, pictures and video. In every case, the interface aims at giving access to the same information to the different actors generally with different levels of education and at the same time. Perhaps, these skills are best acquired through practical involvement.

Fora have to be created to share information gained from indigenous knowledge. Networks are effective tools which allow the flow of information amongst members. These are even more effective in sharing indigenous knowledge which is mostly undocumented. A network should link people from different spheres, professionals from different disciplines and farmers or farmers' leaders. In other words, such a network should give allowance for every member to communicate with people who are not of his/her kind. As in every human venture, such a network relies on the people's dedication at its creation but its efficiency should attract public and private funds to claim an institutionalization.

How to ensure farmer representativeness?

Whenever researchers and extension workers are seeking for the indigenous knowledge of a particular locality, they have to bear in mind the question of representativeness. In other words, who in the locality can give the most correct version? In many areas or sectors, there are no structures for communication flow amongst farmers. Who, therefore, can be a representative of the farmers? Who can be the bearer of the indigenous knowledge? Even where formal farmers' organization exist, can these be viewed as the most representative sources of indigenous knowledge? These questions are open and remain a challenge for both professionals and farmers.

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