

## IMPROVING RESEARCH-EXTENSION LINKAGE AT THE UYOLE AGRICULTURAL CENTRE

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### INTRODUCTION

The Uyole Agricultural Research Centre is a Zonal Research Centre serving four regions in the Southern Highlands of Tanzania. This area has a rather favourable climate and good soils; therefore it is able to produce nearly one third of the agricultural production of Tanzania. There are 7 sub-stations to serve this whole area. UAC has about 45 researchers, so by international standards it is a large research institute. There is also a Training Institute, training each year nearly 250 diploma and certificate level students. Since 1972 UAC has been supported by the Nordic countries and Finland. Some research projects are financed by other donors and Tanzanian parastatals. Therefore lack of finance is not the major problem, contrary to other research institutes in Tanzania.

### SELECTION OF RESEARCH TOPICS

At UAC one can find good agricultural research. This year there are about 230 different research projects; many of them have trials at different locations. I see as a problem for research utilization that most of this is done at a much higher input level than most farmers can be expected to use in the near future. Fortunately there is some tendency among the researchers to use more realistic input levels in their trials.

Most of the research aim at increasing yield per ha. However in the zone, land is not the most limiting factor.

We will have to think about the process farmers can follow to change from a low level of inputs and low yields to higher inputs and high yields. For instance in our substation in Rungwe district the yield of coffee is 2000 kg per ha, whereas most farmers around get about 300 kg. Few of them will be able to use the input level used at the substation, also because they are paid late for the coffee they sell. One researcher proposed as a process of change:

First prune the coffee better. This requires knowledge and labour, but very little capital. From the increased yields it is possible to buy fertilisers, which will increase the yields further. Only then it becomes profitable to use pesticides. If farmers follow this process they might be able to reach in a few years time the same yield level as the substation, but if they are recommended now to use the same practices we use at our substation, they will not be able to do so and will continue in their old way.

Another possibility is to change the input distribution, credit and marketing system to overcome the bottlenecks, which

prevent farmers from using high input levels. This is the approach being used by Global 2000.

#### PUBLICATION OF RESEARCH RESULTS

Another condition for research utilization is that the research findings are published properly. Most of the research is so far only published in the annual reports, as is usual in East Africa. These reports do not provide the information the extension officers need to give farmers good advise. Most trials continue for 3 to 5 years, but so far very few final reports are available on these research projects. This will change soon, because the Research Coordination Meeting has decided that all researchers will write one final report before July 1990; those who don't will no longer get any financial support for their research.

Another problem is the distribution of research reports. They do not always reach the people who might use them, e.g. the extension subject matter specialists on this subject in our zone. It is even possible that they do not reach the tutors in our own training institute, who teach this topic. It seems that one does not always realise that the costs of publishing and distributing research reports are low compared to the costs of the research itself, whereas the research will have little use without proper publication of its findings. Publications which summarise the research done in a certain field are most useful to extension, but unfortunately very scarce.

#### ON-FARM TRIALS

One cannot make extension recommendations only based on on-station research. They have to be tested first in on-farm trials. These trials are needed in order to:

- test research finding under various ecological conditions,
- test research findings under the local situations of input supply and marketing,
- see how innovations fit in the management of the farm as a whole
- see what problems farmers have in adopting innovations,
- use farmer's experience and intelligence in developing good extension recommendations,
- make research findings known to extension agents and farmers all over our zone.

UAC has a fair number of on-farm trials. These are not only carried out by the Farming Systems Research team, but also by several commodity research programmes. Nearly all of these trials are researcher-managed and not farmer-managed. They give valuable information on the possibilities of generalizing research findings to various ecological conditions, but they give only

limited information on how these innovations will work under actual farm conditions. So far there is no close cooperation with the local extension agents for all of these on-farm trials. An exception is the cooperation with the Kilimo-FAO fertilizer programme in Mbeya region a large number of trials are designed in cooperation with UAC, but supervised by the bwana shamba's.

Discussions with farmers and extension agents during these on-farm trials provide an opportunity for researchers to learn directly from farmers about their problems and experiences. So far most of these trials are with relatively well to do farmers or on communal plots; few are on womens plots. This can cause biased information on farmer's situations.

### FARMING SYSTEMS RESEARCH

Farming Systems Research can play an important role in making the research more relevant to the solutions of farmer's problems. So far UAC has given only limited attention to this kind of research. There was one fulltime FSR researcher, who got assistance in various surveys from other researchers. However, most of these other researchers felt that their first responsibility was to their own research programmes. Surveys of farming in various parts of our zone have been done which resulted in lists of farmer's problems on which research could be done. In on-farm trials solutions have been sought for some of these problems. Since January 1990 an agronomist and an animal husbandry researcher have been added to the FSR team. This team is planning to study the farming systems in two areas not far from Uyole. The team does not have research-extension liaison officer; that it considered to be the task of the Extension Section of the Research Institute.

New farming systems, including potato and vegetable production or dairy husbandry, have been developed by farmers. The dairy production systems have been studied by the Animal Breeding Section. For the other systems we still have to learn from farmers how they really work. Some of these systems may cause serious nematode problems.

### COMMUNICATION BETWEEN RESEARCHERS AND FARMERS

Communication should not only be from the researchers to the farmers, but also in the other direction. Without a good knowledge of the farmer's situation, problems and experiences it is not possible to develop a good research programme. The communication process should not aim at transferring recommendations to farmers, but at integrating the knowledge of farmers, extension agents and researchers. Only by using the knowledge and intelligence of all of them can we develop good solutions to the present problems in Tanzanian agriculture.

Mass communication has the advantage that it can reach a large number of people cheaply, but it is well known that it has

a limited effect on behaviour. The combination of mass communication and interpersonal communication is usually more effective. Mass communication might create interest in a new idea, but few people will adopt this idea unless they have discussed it first with somebody in whom they have confidence.

We will now discuss various communication methods, which are used at UAC for the communication between researchers and farmers.

#### LEAFLETS

Not much use of mass communication has been made, because there are few possibilities to reach Tanzanian farmers through mass communication. In the past a number of extension leaflets have been published. We are now in the process of revising and printing them. They have not yet been distributed to all 1000 extension agents in our zone, and the number of farmers which have seen them is very limited. If these leaflets would be written jointly by a researcher and a SMS they would probably be more effective, because they can be better geared to the information needs and the knowledge level of the target group.

#### TRAINING COURSES

More important is that so far about one third of the extension agents in the Southern Highlands have followed a course of one week given by researchers and tutors of UAC. Nearly all of this training was in the classroom; so training in skills, e.g. recognizing plant diseases, could be given only to a very limited extent. Some, but in my opinion not enough, of this training involved discussion on how the bwana/bibi shamba's could use knowledge from scientific research in their own village. Some trainers assumed that by pouring knowledge in the heads of the extension agents these would be able to work more effectively. Also some 200 farmers were trained by UAC in courses of one or two weeks. This may have had only a very limited effect on the behaviour of 700,000 farm families. The main advantages of these courses was that they provided an opportunity to researchers and tutors to learn directly from farmers. This has already influenced research priorities.

#### MEETINGS WITH EXTENSION SUBJECT MATTER SPECIALISTS

In many countries, especially in countries where the Training and Visit System is operating, there are regular meetings between the researchers and the extension subject matter specialists (SMSs). In these meetings they discuss what contributions the available research findings can make to solving farmers problems, which additional research is needed to be able to solve these problems better in the future and the SMSs receive training in the skills needed to apply these findings. Often these meetings are held alternatively at the research institute

both in the field and in the classroom and on farms, where one can analyze jointly what the farmer's problems are and how they can be solved. The SMSs use the experience gained in these meetings to train their village extension workers regularly. In many countries this system has played an important role in making the village extension workers technically more competent and the research more relevant to farmers problems. It is not the researchers, who should develop extension recommendations, but this should be done jointly with the SMSs (McDermott, 1987).

### **FIELD DAYS**

This year UAC organises field days at four substations, which are visited each by some 400 farmers, extension agents and local leaders. During these days they visit the research trials and discuss with researchers their research findings and the implications of these findings for farming in this area. This is an important learning experience not only for the farmers, but also for the researchers.

These field days would be more effective if they become an integral part of the extension programme of the district. On these days a lot of problems are discussed rather briefly. This may arouse the interest of farmers in innovations, but usually they will not adopt them before they have discussed their consequences with somebody in whom they have confidence. In other words in order to be really effective these field days need a follow-up from the extension agents in the villages, who have been trained to emphasize the same messages. To organize this type of field days requires good cooperation between researchers and extension SMSs.

### **RESEARCH EXTENSION LINKAGES**

One way to enhance research extension linkage would be close cooperation between the research and training institutes. This could help to develop among future extension agents a desire for life-long learning about research findings, but it would also be a way for researchers to learn about farmers problems. Many students in the training institute have worked several years as extension agents before they entered a diploma level course, but I have the impression that their experience is not fully utilised. It seems that also the experience of the students during field practicals could be better used to inform UAC staff about realities in the field. I would like to see a closer cooperation between the research and training institute. We try to improve the cooperation between both institutes through organising regular meetings of their staff members who are working on the same subject, but it remains to be seen how effective this will be and which incentives can be given to learn from each other.

Another problem is that in the examinations in the Training Institute, students are tested on whether they memorise the

information presented by their tutors in class rather than whether they are able to use this knowledge to develop solutions to the problems of their farmers. This prepares the students more for the role of a postman, who can pass on the information they receive from researchers and from their superiors to farmers without changing anything in this information than for a role of an educator, who can help farmers to integrate their knowledge with knowledge from research to develop together solutions for their problems. Clearly the kind of examinations given influences the learning style of the students. A reason that these kind of examinations are given, is the rules regarding examinations from Kilimo. It is possible to test more objectively whether students have memorised the knowledge mentioned in the curriculum than whether they have developed a capability to find new solutions for practical problems. At present Kilimo considers objectivity more important than creativity. I am convinced that this is not in the interest of Tanzania, because in this way the intelligence of our graduates is not fully utilised for the development of the country.

#### COOPERATION WITH VARIOUS AGENCIES

UAC cooperates with quite a number of agencies for the development of agriculture in the southern Highlands. Often they ask advice from UAC researchers on their development activities, sometimes they request UAC to do additional research to be able to give this advice. These requests come more often from donor supported agencies than from Tanzanian financed agencies. One reason is that the expatriates in the donor supported agencies know that they have only a limited knowledge of the local situation and development possibilities and look for information sources which can help them to fill this gap in knowledge. They have learned that a research institute can be an important source of information. Not always can UAC fulfil their expectations.

A useful way of cooperation is that an UAC researcher is seconded for two years to the Small Scale Dairy Development Project. Working in such a project gives many opportunities to disseminate research findings and to learn about the problems farmers and extension agents have. UAC works closely with CILCA and NGO working in 12 villages in Mbozi district.

#### WOMEN

Most of the work on farms in the Southern Highlands is done by women. They also influence decisions regarding agricultural development. Many of the donor agencies try to focus on the development of women. One way in which UAC contributes to this development is that now over one third of the students in the Training Institute are women. For them it will be easier to research farm ladies than for their male colleagues. About 15 percent of the UAC researchers are women. My impression is that their contacts with farm ladies often have a positive effect on their research programme, but their obligations at home make it

more difficult for several of them to spend a long time in the field.

## CONCLUSION

There is a general agreement that UAC has had more impact on agricultural production in its zone than other Tanzanian research institutes. In the future an even larger impact is required. The World Bank expects that in 2025 Tanzania will have a population of 75 million, three times its present population. Tanzanians see that incomes in other countries are higher and they like to have a higher income as well. At the same time efficiency of agricultural production is increasing elsewhere in the world which leads to a decrease in export prices. Therefore increased incomes for a larger population can only be achieved if productivity of agricultural research institutes increases.

For an increase in productivity at UAC we have to develop a systematic way to communicate between 700,000 farm families in the Southern Highlands and 45 researchers at UAC. Between these farm families there are considerable differences in farming systems, resources and levels of knowledge, but all of them look at their farm as an integrated whole. Each of the researchers studies one aspect of these farms and has necessarily a limited knowledge of other aspects. One thing that is needed is to integrate the knowledge of all UAC researchers for the major farming systems of the zone. This is partly a task of the Farming Systems Research team, partly a task of all researchers and extension subject matter specialists together. Jointly they should review how we can use our present knowledge to improve the income and production levels and reduce the risks of the major farming systems.

Next we should plan how UAC can combine different communication methods most effectively to inform and receive information from 1000 bwana/bibi shamba's and bwana/bibi mifugo's. This requires a close cooperation between the Extension Section of the Research Institute and the Farmers Wing of the Training Institute, which is responsible for the organization of courses for extension agents and farmers. This plan also depends on the way the extension service organises the communication between their SMSs and the village level extension agents. In this communication process the extension service and the research and training institutes should work together as a team.

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