THE ROLES OF RESEARCH INSTITUTES, THE EXTENSION SERVICE AND NGO'S IN TECHNOLOGY TRANSFER VIA ON-FARM TRIALS

by

G. Holtland
R. Makali

Diocese of Central Tanganyika
MVUMI RURAL TRAINING CENTRE
KITUO CHA MAFUNZO VIJIJINI-MVUMI
P.O. Box 38, Mvumi Dodoma

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Summary

In the 1993/94 cropping season the Mvumi Rural Training Centre did on-farm trials with new sorghum and millet cultivars in cooperation with the SADC/-ICRISAT Sorghum and millet program of the Ilonga research station.

This paper is a reflection on how the researchers, the extension service and the NGO cooperated. Based on this particular case recommendations are given for future cooperation between similar organisations which can lead to a more concerted effort to assist farmers to increase the productivity and sustainability of their farming system.

1. Introduction

The Mvumi division lies in Ugogo, the dry hart of semi-arid Tanzania. Its problems are characteristic for semi-arid Africa: low (550 mm) and unreliable rainfall, poor (sandy loam) soils, overpopulation (75 inh/km^2), out-migration of men (35%) and overgrazing. Fallow periods are reduced to nearly nil and crop residues and the natural vegetation are burnt every year.

The overstocking caused so much erosion that in 1986 the area was forcefully destocked by HADO (=Dodoma soil conservation project). Since 1991 the MRTC is introducing zero-grazing in the area and since the 1991/92 season it also started to work on improvements on the cropping system.

The MRTC is a church based NGO but its practical extension work is done by VEW's from the ministry of agriculture and livestock and from HADO (which is part of the ministry of natural resources).

2. The on-farm trials with millet and sorghum in 1993/94

As a result of the cooperation with the ministry of agriculture and livestock the MRTC is known by extension officers at the district and regional level in Dodoma. So the REO of Dodoma in October 1993 asked the MRTC whether it could assist in conducting on-farm trials in cooperation with researchers from Ilonga. As one of the aims of the MRTC is the development and adjustment of new technologies, it agreed to do so.

At the end of October 1993 the seeds were collected from Ilonga and after some discussion the original design of the trials were slightly modified. In November the seeds were distributed to the farmers selected by the VEW's and the MRTC-village committees. In December the seeds were planted and the rains came in January.

During the growing season the trial were supervised by the VEW's who were supervised by the MRTC staff via monthly visits. The researcher passed by twice and somebody of the SADC/ICRISAT program from the ICRISAT station in Zimbabwe visited the MRTC. In the beginning of May the MRTC staff started to harvest the fields and the researchers and some people from ICRISAT visited the MRTC and the farmers again. In general the cooperation was very pleasant and open.

3. The actual role of the different actors

The researchers

The researchers initiated the trials. They also did the selection of the cultivars to be used and the area where they should be tested. They have a broad overview of the different cultivars and their characteristics and as experienced agriculturalists they gave a lot of comments and advice during the trials on all kind of technical issues like diseases, seeds characteristics, planting densities etc. etc..

The extension service

The extension service was involved in two ways. First the regional level: the REO asked the MRTC for its cooperation and was often present during visits of the researchers. Sometimes he passed on messages from the MRTC to the researchers or vice-versa. Together with the district level he brought visitors to the farmers fields, so already doing extension while the trials are still going on. Secondly at village level the VEW's were involved in the selection of farmers, the selection and lay-out of the fields, in advising the farmers and in harvesting the fields.

The NGO

In this case the MRTC collected the seeds from Ilonga, it modified the trial design in discussion with the researcher, it selected the villages and VEW's to work with, supervised the on-going of the trial, did the harvesting and in this particular case it will analyse the data and publish them.

4. Strong and weak points of the different actors

From the above description already some strong and weak points of the different parties involved can be extracted. Here they are listed and given a more general elaboration, both based on examples form the past season and on theoretical considerations. This will enable us to draw some recommendations in the next paragraph.

4.1 Researchers

4.1.1 Strong points

a. technical knowledge
First of all they have both a broad overview of agricultural development on (inter) national level. F.e. the MRTC staff learnt that the development of the so called 'brown-mid-rib-millet', which stalks are good fodder, is no longer a priority for ICRISAT and is also technically not as fit as we used to think (see Holtland, 1993).

Secondly researchers know statistics. This enables them to know how many replications are needed and how to collect data (f.e. sampling techniques). It also enables them to analyse the data obtained. In the particular case of the on-farm trails in Mvumi, the MRTC was fortunate to have a staff member with research experience who could perform these tasks, but normally this is typically a task of the researchers.

Thirdly researchers have technical knowledge, which is hardly available elsewhere. F.e. in the 1993/94 season the farmers, the VEW's and the MRTC staff learnt more about the (dis-)advantages of different types of sorghum and millet. The MRTC also learnt how to grow our own seeds in the future. Also a lot was learnt about pests and diseases, characteristics of cultivars etc..

b. technical resources
In this case this was first of all the seeds, but it can also be measuring- or computing equipment.

c. networking
Researchers are usually part of a wider network of experts which gives them access to many people/institutions/knowledge. By cooperating, the NGO or the extension service (or even the farmer) can become part of this network. In the case of the MRTC the researcher brought people of different backgrounds to Mvumi. Now we know people of local and international research stations and we get more insight in results of on-going research in these stations. We are promised (extension) material which will assist us in recognising diseases of sorghum and millet.

4.1.2. Weak points

These weak points must be read in the context of on-farm trials, so they do not always count in general.

a. distance to the target group
Most of the time researchers are concentrated in a few research stations, far from the day to day reality of farmers. They are busy with their day to day tasks of on-station trials, publishing, networking, meetings and workshops. So socially and psychologically researchers can be out of touch with the target group. This counts even more for expatriate researchers. As most research stations are in fairly favorable areas researchers are also physically isolated from the farmers. Often technical optimal solutions are used for technical problems. It is one of the good sides of the present lack of funds that researchers are forced to apply less sophisticated methods. The same lack of funds however prevents them leaving the station as transport is expensive.

b. lack of incentives
The above mentioned on-station activities usually yield fairly quick incentives in terms of professional rewards and/or allowances. On-farm trials on the other hand are remote, ask a lot of attention and sweat and have a far lower chance of success. It is a good development that these days the professional rewards for on-farm trials is increasing quickly. At the same time the salaries of researchers need to be increased so that they can dedicate themselves to on-farm research without having to undertake all kind of income generating activities for their families.

c. lack of funds
As the government has a severe shortage of money, few funds are available at the moment. It seems that international donor agencies give agricultural research also a low priority, unless on-farm trials are done or research on 'trendy' subjects like agroforestry.

4.2 Extension service

4.2.1 Strong points

a. continuity and infrastructure
Despite a general lack of funds agricultural extension services have (and will) always be maintained by the government. In most cases it is possible to find some experienced extension officers who know a lot on past and present successes and failures of introduced technologies.

Due to its continuity the extension service has, over time, been able to secure a good infrastructure in terms of personnel and means (f.e. office and means of communication). F.e. in the present case the radio-call of the regional agriculture office was sometimes used for communication.

b. extensive
It is one of the most extensive government services in the country. It often reaches down to village level. In the case of Mvumi division 8 extension workers are present for the 13 villages. This makes it possible to select the best villages and extension workers.

c. close to the target group
The VEW's in the villages are both physically and socially close to the target group. More often than researchers they are from the same ethnic group. They cultivate their own field in the same way as the farmers and in the evening they drink the same beer. All this enables them to select the right farmers. The close social relation also makes the farmers to trust the VEW and the 'strangers' who come with him/her. This makes it more easy for farmers to tell the outsiders their real problems and their thoughts about the newly introduced technology. In the present case the best data were obtained from the village with a VEW who is socially very close to the farmers.

d. aware of the local farming system
Detailed knowledge of local soils and local management systems enable the VEW to implement the on-farm trial smoothly. F.e. knowing that dry planting gives the best results in Mvumi makes it easy for the VEW to allow farmers to do so while the researchers preferred a proper land preparation before planting.

4.2.2 Weak points

For the case of on-farm trials the extension service has the following weak points:

a. lack of mandate and skills
Extensionists are not trained to do research so basic skills like how to design a trial and how analyse the results statistically are lacking.

b. lack of funds
As even for normal extension activities funds are lacking, no money at all is available for adaptive trials. Next to the absolute shortage of funds, the large number of people working in the extension service on higher levels (district, regional, national) and the difficulties in measuring (monitoring) the output of extension lead to a lot of embezzlements of funds.

c. (sometimes) distrusted by farmers
As the extension service is part and parcel of the government it is sometimes regarded as alien by the farmers. In the case of Mvumi the forceful operation

Dodoma, the failure of the government to bring basic services to the villages and the large scale embezzlement of funds by CCM leaders made the farmers shy away from the government and its organisations. On the side of the agricultural extension services this was still engraved by the experiences of Global 2000 whereby some farmers were threatened to be put in prison if they did not pay their loans back. This was felt to be very unfair after a season of a nearly complete crop failure.

4.3 NGO's

Of course not all NGO's are the same and many are only partly NGO and partly they work with the government. Instead of 'NGO' sometimes it is better to use the word 'project'. So the characteristics of a NGO differs from case to case but in general they have the following strong and weak points when it concerns on-farm trials:

4.3.1 Strong points

a. close to the target group
Like the VEW's most NGO's live and work close to the target group. This is an essential part for the other strong points b and c.

b. aware of the local farming system
Also here the same arguments as for the extension services count. In the case of the MRTC the staff was able to convince the researchers to reduce the number of farmers in the trial and to increase the area planted per cultivar. This was necessary as the soils are very variable and small plots could lead to very high coefficients of variation. As from previous experiences (both in trials and in extension) with chemical fertilizers it was clear that they were hardly profitable in Mvumi, the MRTC could also convince the researchers that farmers would not like the idea of using it in the trials.

c. trusted by the farmers
As NGO's are not associated with disliked issues like taxes or enforced measurements they are more easily trusted by the farmers. Often they look for the active participation of farmers via all kind of committees. These committees can often (at least in theory) influence the policy of the NGO as this is usually less rigid then in government structures. In general the personnel of NGO gets better salaries and more moral support than civil servants, so they are often better motivated.

d. enough funds
By and large NGO's (or projects in general) have more funds than government services. This enables them to pay better salaries and transport facilities. With higher salaries better personnel can be attracted, although the promotion chances are usually nearly nil.

4.3.2 Weak points

a. lack of continuity and infrastructure
The fact that NGO's (projects) do exist for over ten years or more does not change the basic fact that they nearly always work with a limited time horizon. So in the long run there is no continuity and a lot of experiences are lost when NGO's die, also as their work is often poorly documented.

b. no mandate
Most NGO's feel that they do not have a mandate to do research, also because of their limited time horizon. They are usually more development oriented. F.e. the MRTC asked the researchers to plant larger areas so that the research plot could also serve as demonstration plots.

c. lack of skills and resources
Due to the above, real NGO's hardly employ qualified researchers. On the other hand many semi-government projects (f.e. like many integrated rural development projects on district and regional level) have qualified personnel (often expatriates who have their own advantages and dis-advantages).

d. little networking
Again as result of the above, the few qualified personnel available often do not have the necessary network to do research and to publish the results.

5. Recommendations for future cooperation in technology transfer

The word technology transfer does not seem appropriate in this context. It suggests that a certain technology exists in one place (the research station) and should be brought to another (the farmer). It seems that the very many different farming systems in Tanzania all need their own locally developed solutions. As these farming systems are only uniform in small areas the capacity of the research institutions to analyse all these systems and come forward with appropriate solutions is by far not enough if conventional research techniques are used. So more action-oriented-research is needed.

In this action-oriented-research the different types of institutions as described above (research institutions, extension service, NGO's) should work together as none of them can do it alone. As shown in paragraph 4 their strong and weak points in this kind of research are complementary. Together they can win the trust of the farmers and they can work together with the farmers in properly defined trials. At the same time all involved (researchers, extensionist, NGO-personnel and farmers) can learn a lot from each other and all can widen their ideas on agricultural development. In the case of on-farm trials the learning process of all actors will often be more important than the technically insight gained from the results of the trial.

Seeing the above, the cooperation between the MRTC, the extension service and the SADC/ICRISAT Sorghum and millet program of the Ilonga research institute can be regarded as successful, both in terms of technical results as in terms of a learning process for the actors involved. One major improvement could and should be made: farmers themselves should formulate their most urgent problems and the direction in which they think a possible solution can be found. It would be the task of the MRTC (with the VEW's it is working with) to encourage farmers to formulate their research needs and to forward these to researchers.

Based on the above future cooperation between research institutions, the extension service and NGO's or projects in the field of on-farm trials (and on agricultural development in general) is highly recommended as all of them have too many weaknesses to guide the agricultural development process in the many diverse farming systems of Tanzania. This cooperation should be based on a thorough analysis the strong and weak points of each of the partners involved and on a written agreement between them to guarantee continuity.