

SOME PRACTICAL PROBLEMS IN FARMING SYSTEM RESEARCH

KENNETH MACKAY^{1/}

Farming System Research (FSR), or what used to be called Cropping System Research, in Asia is now 12 years old. We are dealing with FSR as with teenager in that we seek to understand its behavior and the direction it is going to take. Past history shows that many of the cropping systems/patterns as well as technology have been tried and tested in many sites and countries with a mixed result. In many areas extension of farming/cropping systems has been successful in increasing the intensity of agricultural production, but elsewhere the benefit of increased production may not accrue entirely to the farmers. As a representative of the donor agency which has been involved in farming/cropping systems research from the very beginning, and have to ask the questions and constantly examine FSR in the light of its results whether it has increased the lots of small farmers, or the productivity or income of farm family, and/or has reduced farmers' work load. These are the criteria we have to use in judging the end products of FSR.

There are so many people here having experience in FSR works in Thailand and Asia, and now there is much understanding among researchers and policy makers of the need for farmers' involvement in developing, testing, and assessing technology. Researchers also have a much better and through understanding. Through such techniques as questionnaires, RRA, of the farmers, the problems, and the criteria for making decisions. Yet, I am skeptical, I farmed for at least twelve years and worked in the extension, it did take me very long to discover that farmers had traditional knowledge, they experimented it constantly, and they made decisions based on a complex of factors which might be risk aversion, labor requirement, something that anthropologists call tradition, economic, but not the net return. Farmers are very seldom able to make the last factor out, economists are believed to be not able neither. However, the economist is the manager of farm family or home economics concerning with consumption, sources of credit, who will lend inputs, when the loan due, when school fee must be paid, when are festivals, etc. All

^{1/} Summarized by Laxmi Worachai

of these are important to farmers, and becoming clear to researchers that the farm is a very complex system. However, we do not have to understand it all if we much more closely with farmers because we do not have to have the model to integrate that, the farming systems will do it for it. To day, I do not attempt to do rigorous analysis of FSR just what have seen from works with various project in Asia.

As Rebert Chamber said farmer first, farmer last, we will start with practical problems of FSR at the farm level. Major weakness in FSR lies in the difficulty to get to the farmer first. From the pictures of fish/rice project, I try to illustrate some of the practical problems of on-farm research. For example, when dealing with the integrated systems like fish and rice, one can forget about randomized complete block. The farmer will not randomize, he puts the fish where it happens to have the weirs where he can catch them. There is also difficulty with samplings. Fish are more difficult to sample than rice. One cannot see them or drag in at through the rice paddy, even when one has a small farm or a deepen end. It is not clear whether fish are there or whether the samplings are done on the representative population. In doing on-farm research, researchers also have to deal with the variability and incredible variability; particularly in the less favorable environment like the northeast where soils are heterogeneous and rainfall is uneven. What researchers are trying to do is assessing the increase in the yield due to the addition of fish into the paddy. Essentially, it is the superimposed trial. However, one can see differences in height of the rice in each field. There are, statistically significant, greater variabilities within plots and within fields than it is between fields; and it is even much greater between treatments. To make the best use out of time and research dollar, it is very essential to seriously look at on-farm testing from a much more rigorous point of view. The data the researchers collect must be kept to a minimum and make sure that the right data are obtained. The absence of data means a loss of one year or one cropping season information.

What I have not seen within that national programmes in Asian Farming Systems network is much more a back up in terms of methodologies for on-farm research. Most of the programmes are just simple design, simple analysis. Take a very hard look at what data being collected from fish/rice project, data collected on rice in terms of height, yield based on cropcut, also hundred of seed weight on the number of kilograms, and number of plants. Some of the data are not useful in terms of what the researchers are looking for.

Certainly, a hundred of seed weight and the number of tillers did not tell the researchers about the yield which is what they are looking for. To make the best use of on-farm research, one has to be very critical about the design, analysis, and the data to be collected.

Second area up in the Farming Systems hierarchy is the researcher-managed on-farm trial. There is a list of difficulty with this. For example, researcher-managed soybean trial on farmer's field where next to it is another farmer's field worked with traditional means of planting, putting the seeds in the grounds with some loose soils springing over. The researcher manages trial by having the field tilled, hilled, and comes back after seedling to thin the soybeans. This is not a trial by someone who wants to look at with farming systems perspective, but it was a trial to look at nitrogen fixation. On the farmers' fields, they are two different agro-ecosystems even though they are side by side. It is not sure whether the nitrogen fixation under this condition will tell anything about farmer's conditions. Difficulty with on-farm researcher-managed trials is that they are expensive, usually much more expensive than research station trials, they should be used with care only when they can give information that cannot get from other ways. On the other hand, the farmers can produce the crop much better than researchers given the same inputs. Therefore, in terms of reflecting farmers' management, this is not a very good compromise. The use of researcher-managed trial should be examined carefully only when it can be extremely useful.

Up in the hierarchy to which FSR can make considerable contribution but the potential has not come throughout yet are the feedback to breeders and the production of varieties that are truly suitable to farmers condition, not just fit into cropping patterns but really are selected and adapted for farm conditions.

The scheme of the breeding systems used in both national and international programmes usually takes somewhere between 6 to 15 years to release the varieties to farmers, depending on the crops and the expertise available and whether it is in the national or international centers. The progression takes from the initial screening and breeding materials to the parameter yield trials then either, if it is in international center, it may go into international yield trial then to national yield trial, or it may go directly into national yield trial, and this will be another 2-4 years. It may take somewhere between 8 and close to 20 years to get a variety into the national

seed increase so as to release to farmers. In the scheme, almost all everything are done on the experimental station and what is missing is the farmer field testing. What often happens is that after the national trials, or may be simultaneously the farmer field testing comes in, then that may be used along with the national yield trial to decide whether the variety be released to farmers. This strikes me as awful waste of time, because it is 6-15 years at least, to find out whether it is suitable under farmers' condition. Now what happens in many countries is that there is farmer's field testing but not linked in with the national variety release system. Therefore, there may be testing even early generation material but there is not the formal linkage after that will get into the national system.

I am addressing here is the institutional problems and stress at the institutional level. Farmer's field testing for varieties has to be done much earlier in the farmer's field. Hopefully, that would solve the comment that many breeders made, "my variety has out yielded the check by 40% but farmers do not adopt it".

I have attempted to suggest a few areas where FSR needs to be improving but certainly not all are comprehensive. May I conclude that FSR is still a young teenager, it, however, needs a firm direction for the next few years in order to grow up on its own.