

**Barriers to Farmer Participatory Research:
Moving from Constraint to Opportunity**

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Abstract

Some authors have noted that farmer participatory research (FPR), the collaboration of scientists and farmers in agricultural research and development, has failed to produce many agronomic research results. Jeffery W. Bentley has identified seven basic problems that limit scientists' ability to collaborate with farmers: poor access, different observational and experimental styles, different economies and environmental mosaics, time constraints, and social distance. This article, based on the authors' experience with FPR in China, Indonesia, Madagascar, and Vietnam, describes attempts to overcome these barriers through a variety of on-farm interventions. More importantly, the authors explain how these apparent obstacles to FPR can actually be exploited as opportunities to enhance the research process, and thus the results, for the benefit of both farmers and scientists.

Introduction

Participatory research is a process in which all participants are involved from the initial design of the research project to data gathering, analysis, final conclusions, and follow-up actions (Whyte et al. 1991). This process, when applied to the farmer, has often not been implemented with full participation of the farmers. Connell (1997) depicted an example of a disastrous case in Irian Jaya and pointed out some of the pitfalls of half-hearted projects in which the scientists make major decisions without going proper understanding of the local political economy through a participatory process. Failure to follow through with the participatory process may result in local people's disagreement with the project and the loss of their cooperation (Reckers 1997).

Because farmers' participation is often not fully integrated, farmer participatory research (FPR) has become "a promising idea that has not lived up to its promise." (Bentley 1994:140). Despite the advantages and importance of farmer participation, Bentley (1994) delineated seven barriers to farmer-scientist collaboration: poor access, different observational and experimental styles, different economies and environmental mosaics, time constraints, and social distance. These barriers indeed pose serious constraints to effective FPR and must be addressed in order for an agricultural scientist to accomplish project goals through the process of FPR. This paper draws on the authors' experiences of working with farmers in development projects in various countries to discuss ways of moving from constraint to opportunity in FPR.

Case Study Descriptions

The discussion of overcoming the barriers identified by Bentley is based on the authors' involvement in projects in Vietnam, China, Indonesia, and Madagascar. The following brief overview of these projects is provided to facilitate subsequent discussion and readers' understanding. It is worth pointing out that one common feature of these case studies is that almost all the participants in these projects were women.

Sweetpotato is an important crop in northern and central Vietnam; however, recent changes in food preferences have marked a decline in consumption of fresh sweetpotato roots. Diversification of sweetpotato utilization offers possibilities for added-value and alternative market potentials. Diagnostic surveys, on-farm trials, and market studies have been conducted to understand and improve the traditional sweetpotato-pig feed systems and to introduce sweetpotato starch and noodle processing. An on-farm pig feed trial in Thanh Hoa Province of Northern Vietnam was conducted to find ways to improve the current sweetpotato-pig system (Peters 1998). Sweetpotato starch and noodle processing projects consisting of varietal selections,

improvements in processing techniques and equipment, and market identification and connection for the processors, have all been conducted on farm.

A similar situation with sweetpotato production and utilization in China has also led to a study that identified opportunities to generate income through diversified utilization. This research consisted of a socio-economic, agronomic, and market study and an on-farm pig trial, with treatments designed to take into consideration the local conditions (Peters, ms submitted).

A different set of socio-economic and market conditions indicated that pig feed and starch are not viable possibilities for sweetpotato utilization on Java, Indonesia. Islam is the dominant religion on the island, thus few pigs are produced and consumed, and sweetpotato starch noodles are not currently found in the market. Sweetpotato flour was identified as a potential processing alternative because Indonesia relies completely on imported wheat flour to meet market demands. Following a pre-feasibility study, in which the appropriate sites for processing and the necessary technical trials were identified, a series of on-farm trials to produce marketable and profitable sweetpotato flour was conducted (Peters and Wheatley 1997). The subsequent pre-piloting phase of the project included on-farm varietal selection trials for best processing potential, on-farm processing trials to identify the most appropriate techniques and equipment, market studies to determine the requirements for the flour, and entrepreneurial training to prepare the processors to connect to markets and to manage small businesses.

A newly designated national park in 1991, in southeastern Madagascar, initiated a project to integrate conservation and agricultural development. One author was engaged in the conservation of the national park, whose responsibilities included participatory delineation of the park boundaries, development of alternative economic activities, and establishment of a community structure to handle distribution of the park entrance fees (Peters 1998). The other author worked with villagers in the same area to identify development priorities, strategies, and implementation schemes. The activities included irrigation water management, varietal trials of various crops, fertilizer trials, and health care planning (Peters 1995).

Moving from Constraint to Opportunity in FPR

A Scientists can reach farmers: overcoming poor access to poor farmers

During an interview with the participants of a Farmer Field School (FFS) in Vietnam, the farmers revealed that the participants of the FFS were all among the wealthiest in the village. They explained the phenomenon

with the following reasons: 1) poor farmers have less time for learning as they devote most of their time to dealing with basic survival needs; 2) often wealthier farmers are better educated and easier to work with; and 3) wealthier farmers are often linked to the local power structure which is responsible for selecting the participants.

These constraints appear quite universally and do not seem to be limited to any specific project or location. While the authors conducted field trials to improve rice yields in Madagascar, the poorest farmers were too busily engaged in their most important activity, “looking for food,” to be interested in the trials. This survival activity required much greater urgency than research activities that might improve their rice yields a few seasons away. Thus, the participants in the trials turned out to be a few of the wealthiest farmers who could spare the time, effort, and mental energy.

Providing some minimum pay would encourage participation from these poor farmers, yet this is a highly controversial topic. Some critics argue that farmers should not be paid for participation in research projects that are aimed at improving their lot. This issue could be tied to the level of confidence a researcher has in the potential benefits of the research. Unless the researcher is fully confident in the magnitude and immediacy of the benefits, it is perhaps reasonable that the participants should be remunerated for their time and effort, which could alternatively be devoted to other activities, such as “looking for food.”

In the case of the various pig trials, even if the outcomes of the trials proved inconclusive, the participants at least owned the pigs at the end of the trial. Thus, it was well justified to require them to contribute some labor and minimum cash input. The sweetpotato flour trial in East Java, on the other hand, yielded no direct benefit to the participants since the only end-product was a few kilos of sweetpotato flour of little cash value. Moreover, the level of confidence that sweetpotato flour could become a profitable venture for these participants was low, thus the potential benefit of this research was completely uncertain. Considering this low level of confidence, the potential for the participants to benefit from this research was low. The participants should not have to bear any trial costs when we have low confidence that these costs may pay off in the future. If the scientist makes sure that the farmers are remunerated for their participation (getting pigs for a pig trial, or getting cash pay for a flour trial), usually a very small part of the total research costs, one obstacle to reaching the poorest farmers can be removed.

Difficulty in working with poorly educated farmers is mentioned as a second reason for lack of participation from poor farmers. While conducting a on-farm pig trial in China, we selected one of the

households because it was poor, a compromise between the authors and the local authorities who selected only their close associates. As it turned out, it was difficult to work with the participating woman. She was illiterate, and therefore could not understand the written daily rations, nor could she record the pig feed composition and weight. And she would often frustrate us by repeatedly failing to follow the feeding instructions. It takes more patience to work with such a participant, yet another illiterate woman posed no problem at all. Precautionary measure we took was to have other participants to assist her. With patience and persistence and some assistance from other participants, it certainly was not an insurmountable task to work effectively with.

A third reason cited for a general lack of participation by poor farmers is related to local power structures. To prepare for a sweetpotato-flour processing trial in East Java, we asked the village head to select the participants. Not surprisingly, all the selected participants turned out to be closely related to the village head and his wife. Even the trial equipment was contracted from more of his close relatives. This is a difficult constraint to overcome for it is important to respect, and have a good relationship with, the local power structure. Moreover, such selection of participants is traditionally the responsibility/right of the village head. However, like the case of the selection participants for of the pig trial in China, it is possible to apportion the selection privilege between the local authority figures and the researchers. For example, during a follow-up validation pig feed trial in Vietnam, the poorer households were not among those selected for participation by the local officials. However, we viewed our role in the community as both researchers and development practitioners, and felt it important to include the poorer households on both counts. We therefore asserted our privilege to select some poor farmers.

It is understandable that these difficulties might discourage researchers from “doing the right thing” (i.e., ensuring the participation of poor farmers.). Remunerating farmers for their time and effort (after all, everyone else involved in the project is paid, so why shouldn’t the farmers benefit likewise?), being patient and persistent with less-capable farmers and mobilizing other participants’ assistance, and tactfully negotiating with the local power brokers are ways to move beyond constraints of providing opportunities to poor farmers.

B. Scientists can adopt farmers’ observations

Indeed, a researcher observes a situation from a scientific perspective while a farmer forms a pragmatic view. A failure to consult the farmer participants for their perspective during the initial design may lead to irrelevant research and/or faulty design. For example, while designing the pig trials in Vietnam, the collaborating

national animal scientist, who was to formulate the daily ration treatments, insisted that peanuts should be included in the diet because it is high in protein (scientific observation). But the participating women farmers pointed out that they would never feed peanuts to pigs (except for a small amount of unmarketable peanuts) because peanuts command such a high market value (pragmatic observation). Upon further examination of the prices of various potential feed components, it became clear that peanuts would not be a suitable candidate for pig feed, and was thus excluded from the feed formulation (Table 1).

This illustrates the potential problem of not involving the farmer participants during the initial design in order to incorporate their pragmatic views. Furthermore, there is the potential to draw faulty conclusions without involving participants in data analysis. In an attempt to determine the feasibility of sweetpotato flour production in East Java, labor cost of processing was estimated based on local wages (Figure 1). This cost was then added to the cost of materials to determine whether the total cost of producing one kilogram of flour would exceed the market price, thus ruling out an acceptable profit. With this scientific view, one obvious option was to reduce labor in order to decrease the total cost. However, the women later expressed their own view of acceptable profitability, which was simply a marginal difference between the raw material cost and the market price, regardless of the processing time and cost. In other words, their idea of economic feasibility pointed to the importance of increasing profit through a higher root:flour conversion rate instead of through a reduced labor time. Learning their view not only directed us toward relevant analysis of feasibility, but it also provided the direction for follow-up technical research.

C. Scientists and farmers can reach for compromise on divergent experimental styles

It is far more difficult to adhere to the entire process of FPR, and keep the participants involved in all aspects of the research, than to simply have them participate in data collection. Farmers plan their own experiments as they go while researchers have a more rigid plan. Thus it is difficult to balance between farmer participation and maintenance of scientific standards. For example, while weighing the pigs at the beginning of the feed trial in Vietnam, the participants, observing that weighing traumatized the pigs, requested that we not weigh the pigs three consecutive days to establish an average beginning weight. Their view was well considered because weighing in such a primitive way on the farm indeed added additional trauma to the piglets that had recently moved into a new environment. However, it was necessary to establish a precise beginning weight, especially in light of the primitive weighing method employed in the project, which could be expected to be less

precise than a sophisticated set of scales. In balancing the participants' concerns and the need to uphold scientific standards, we compromised by weighing the pigs every other week as originally planned, instead of every week, after the beginning weight had been precisely established by three consecutive weighings.

Even though on-station research avoids the complication of working with farmers in their own environment, and makes the research more controllable and manageable, it risks yielding results that are irrelevant to the conditions of the targeted beneficiaries, thus, risking the possibility of yielding little or no impact. Agricultural research is a means of achieving an end, that of improving farmers' livelihoods, and FPR can be an effective means, even though this means may not always be neat and tidy and often requires compromises. Nevertheless, we must consider the question: what is the social value of a piece of well-executed research that is devoid of relevance to farmers' lives?

D. Scientists can bridge different scales of economy

As highlighted by Bentley, farmers are not concerned whether the research results can be replicated, extrapolated, or generalized; their concern with the relevance of the research is limited to the potential benefits for their household. In both the pig trials in China and Vietnam, the participating households were far more interested in the growth of their pigs than the overall quality of the research. Therefore, they exhibited a tendency to add extra feed to the prescribed pig diet if they were not satisfied with the pig growth. Whether or not this biased the results of the trial was not a great concern of theirs. We also had an experience with Malagasy farmers who harvested a rice experiment from their field when they decided it was time to harvest. The decision was based on a pragmatic observation—it was a good day for harvest—and the fact that the data from the experiment had to be collected simultaneously never entered their decision-making process.

These examples serve to remind researchers to find ways to work with farmers on their terms and to fully convey the idea of the research to the participants. Subsequently, before a trial, we always held a meeting with the participants to fully explain and discuss the justification, the methods, the timing, and the implications of the research, as well as the importance of their participation. This embraced their participation with a sense of mission and extended their responsibility to neighboring households. During the flour trial in East Java, the participating women showed a strong sense of responsibility toward their work. After they laid the sweetpotato shreds out in the sun to dry, the women would come by several times on their own initiative to stir the shreds to

facilitate faster and more even drying. When the wind blew, the women would dart into the drying area to keep the shreds from blowing away. Their actions showed much pride and ownership of the research.

In addition to pre-trial meetings, we impressed upon the participants the significance of their participation in the trial by holding a large extension meeting when the trial was completed. During these meetings, the importance of their accurate collaboration was strongly appraised in front of the local officials and their neighbors. In addition, each woman presented her experience and results during the meeting. To reinforce their pride and the wider meaning of their participation, whenever we met with farmers, we also gave them examples of how and where the results were used. For example, we used the Vietnam trial as an example to encourage sweetpotato-pig farmers in Uganda to strive for better pig growth with proper management; likewise, we have used the results of the East Java flour processing experiment in other sweetpotato producing countries. This is not only an expression of our personal belief in the importance of the farmers' role in the trials, but it also helps us bridge the difference between the two levels of economy.

E Scientists were once Peace Corps volunteers: overcoming time constraints

We certainly concur with Bentley that students, Peace Corps volunteers, and field agents of non-governmental organizations (NGO) are in the best positions to successfully conduct FPR because they can live and work in remote villages. Many researchers, however, were previously students, Peace Corps volunteers, or NGO employees and, through such experiences, gained invaluable insights into working with farmers. Through these insights, researchers may now provide technical and scientific guidance while students, Peace Corps volunteers, NGO's, or extensionists work as intermediaries with farmers.

Even if the researcher can conduct FPR by collaborating with some intermediaries, the importance of the researcher's insights from working with farmers and his/her supervision of the intermediaries should not be underestimated. This is to say that there is no substitute for the researcher spending some time with the farmers to advise the intermediaries of the particulars of working with a specific group of farmers, and to provide supervision. In Indonesia, through conducting a survey and two subsequent technical trials for processing flour in the villages, we learned about the local social and power structure. The subsequent pre-piloting research activities were contracted to an NGO to overcome time constraints and the vagaries of the local power structure. It was only through the previous insights that we were able to evaluate and advise the NGO's proposed FPR activities in the village.

Persistent supervision is also a key to successful FPR through intermediaries. After the success of our pig trial in Vietnam, a follow-up validation trial was conducted with the same intermediaries from the local extension service. Due to the previous successful collaboration, we relaxed the supervision of the intermediaries and trusted them to do the same thorough job they had done previously. The result was a disaster—no explanation and discussion of the trial or training was provided to the new participants, the guidelines for the trial were not followed or enforced, the feeding rations and methods were not standardized, funds for the pigs were not all passed onto the participants'. The farmers had no one to turn to due to the absence of the researcher in the village during the validation trial. Two lessons were learned from this experience. Firstly, the researcher's regular presence in the field is crucial despite the important role played by the intermediaries. Secondly, the previous successful collaboration with the intermediaries was partially the result of close supervision, and it is only via the same mechanism that we could expect further success. In other words, working with intermediaries compensates for the time when the researcher is not on site, but the researcher must maintain a certain active level of participation to resolve possible conflicts and provide proper technical and general supervision.

F. Scientists can adapt research strategies to accommodate the unique research needs of widely varying natural and social environments

Bentley's concern with widely varying natural and social environments is a well founded one. Most agricultural researchers probably have been confronted with the task of dealing with overwhelming variations, regardless of the research subject. In Madagascar we had to work within two diverse natural, social, and cultural environments where one ethnic group occupied the high plateau, practicing irrigated rice cultivation, and another ethnic group inhabited the lowland forest, engaging in slash-and-burn agriculture. The different agroecological conditions fostered two distinct sets of social organization, cultural practices, development needs and expectations, and patterns of interaction with outsiders. Adapting to these variations, we had to encourage and help one ethnic group to identify their development needs, while focusing on prioritizing the endless development needs identified by the other ethnic group. Variations between the villages located on roads and the ones in remote areas also demanded distinct strategies. In this case, stratifying samples on the basis of ethnicity and location was useful in setting research agendas to accommodate the variations.

Similarly, during our surveys to understand the constraints and opportunities of the sweetpotato-pig systems in central China, north and central Vietnam, Irian Jaya in eastern Indonesia, and Uganda, we discovered

a tremendous range of variations. The common thread among these areas was that sweetpotato vines and leaves were fed to pigs as the primary source of feed, but the socio-economic, agronomic, and market conditions were varied enough that the research had to be designed specifically for each surveyed site. Even within the same province, a mountain district and a coastal district exhibited different constraints and opportunities for system improvements. These differences dictated different research agendas in each area, one designed to utilize fish as a protein supplement and one designed to select improved sweetpotato vine varieties as a major source of protein. In this case, the important thing was to identify the generality that could be applied across the differences. In the case of pig rearing improvement, the research results on balanced daily rations, feeding habits, living environments, and disease management could be applied to all situations.

The Farmer Field School (FFS) model also appears to offer a possibility to overcome this constraint. This approach begins with needs identification using participatory rural appraisal methodology, followed by participatory technology development in which both farmer-led experiments and on-station scientist-led experiments are targeted to develop technology to address the needs. Once the technology has been developed, the FFS is established to apply and test the technology on farm, while advanced farmers are trained to become trainers in the school. The FFS farmers later take charge of conducting experiments to solve their own problems, with technical backup from the scientists or intermediate NGO's (Van de Fliert et al. 1998).

G. Scientists can narrow the social gap between themselves and farmers

It is a fact that a social gap exists between researchers and farmers. However, even if the gap cannot be completely bridged, it can certainly be narrowed enough for meaningful collaboration between the researchers and the farmers. Bridging the gap can only be accomplished by the researcher's conscientious efforts. Throughout the authors' experiences, the following efforts have always been useful in narrowing the gap and facilitating greater and more meaningful collaboration:

- *Learning the language.* Farmers all over the world appreciate outside researchers making an effort to learn their language in order to communicate with them. Obviously that a researcher cannot learn all aspects of all relevant languages, especially given the time constraints. But even rudimentary communication in the farmers' own language helps to bridge the social gap because, what the farmers appreciate is the effort and interest of the researcher, not necessarily the level of communication. We have noticed that the doors into

elaborate social worlds were opened to us when we communicated with farmers in Malagasy, Chinese, Indonesian, and Vietnamese.

- *Spending time in the village.* We have always stayed in the villages, with farmers when permitted, while conducting research. We have done this in villages in Madagascar, China, Indonesia, and Vietnam. This has greatly facilitated forging relationships with farmers. Granted that we often stayed with the power figures, such as the village heads in Indonesia, or the village king in Madagascar, but this in turn enhanced our influence over their sometimes self-centered decision. And there were plenty of opportunities to visit and interact with farmers. Sleeping and eating among the farmers is a way to break down social barriers and also facilitate learning the language.
- *Being helpful to farmers.* Researchers have their agendas and objectives while working with farmers, and farmers have their own aspirations. While we hope the farmers will be cooperative in helping us achieve our goals and objectives, we must be ready to reciprocate, especially since their requests are often quite reasonable. For example, the farmers in Madagascar once asked us to take photos of each of the adults for their national identity cards. For funerals, farmers also sometimes requested use of the car. Small gestures of complying to farmers' requests help narrow the gap, but researchers must take care to balance these requests with their time and resources.
- *Consulting farmers for their opinions.* Farmers are generally hesitant in expressing their opinions, especially when they are not certain how the opinions will be received. The best way to encourage farmers to express their opinions is to incorporate these opinions into the research wherever possible. The women involved in the East Java flour processing trials suggested that we wash the sweetpotato shreds three times before drying to improve the color of the flour. This suggestion was incorporated into the subsequent trials and it did help improve the quality of flour. Interestingly enough, this suggestion also coincided with the scientific recommendation contained in the literature. During the pig trials in China and Vietnam, the women gave many suggestions, from feed rations to feeding methods to weighing schedules and length of the trials, and most suggestions were incorporated into the trials. When they felt their suggestions received due respect, the farmers expressed their opinions more freely as the trials continued.

Conclusions

The merits and importance of involving farmers' participation in agricultural research have long been established, what is debatable are the methods of carrying out FPR. Due to the difficulty of conducting "true participatory" research, Bentley urged that "social scientists and others should begin to document FPR with the warts and all, telling where and when and how it works and how it fails" (Bentley 1994:146). It is in this spirit that we have shared our successful and not-so-successful experiences of working with farmers in agricultural research. We concur with the barriers to FPR identified by Bentley, but in this paper we drew from our experiences to discuss how we have begun to move from constraints to opportunities. The basic principle we identified was researcher's commitment. This includes a commitment to finding ways to include poor farmers, to working with farmers on their own terms, and to bridging the social gap between the researchers and farmers by living with and learning about farmers' lifestyle. Furthermore, identifying and collaborating with intermediaries between the researchers and the farmers can greatly enhance the success of FPR, provided that the researcher makes a conscientious and consistent effort to advise and supervise the intermediaries. Farmers' participation is a key element to successful agricultural research and development, but it takes the unwavering commitment of the researchers to make it an effective tool.

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