Facts, Fantasies, And Failures Of Farmer Participatory Research

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ABSTRACT Farmer participatory research (FPR) has generated many programmatic statements and few technologies. FPR has probably been of interest more because of dissatisfaction with the green revolution and agricultural establishment research than because of a proven ability of scientists and farmers to collaborate together. There are several barriers between farmers and scientists, not the least of which is social distance. The role of FPR should be critically examined; it may work best setting research agendas or in the case of researchers who can dedicate themselves to FPR full-time for quite some time.

Farmer participatory research (the collaboration of farmers and scientists in agricultural research and development) is a promising idea that has not lived up to its promise. There are more programmatic statements about farmer participatory research (FPR) than you can shake a granola bar at, but few agronomic research results. This may be because FPR gained academic popularity before it had proven its worth in the field. Working with farmers may call for skills that not everyone has.

A Brief Review of the Beginnings of FPR

Early FPR

The notion of farmer participation in agricultural technology generation started with the work of three researchers: Stephen Biggs, Robert Rhoades and Paul Richards (Biggs, 1980, 1986, 1989; Biggs and Clay, 1981; Rhoades and Booth, 1982; Rhoades, 1982, 1987, 1988, 1989; Rhoades and Bebbington, 1988; Page and Richards, 1977; Richards, 1985, 1986, 1989a, 1989b). Working separately, all three came to essentially the same conclusions by the early 1980s; that farmers have valuable knowledge, that they do agricultural research on their own, and that scientists could work with them to improve agrarian R&D (research and development). Eventually Biggs, Rhoades, and Richards began to cite each other's work without acrimonious debate, suggesting that they found each others' ideas similar enough to their own to avoid quibbling over details.

Richards (1985, 1986) demonstrated that farmer experiments include self-conscious rice variety selection. Rhoades and Booth (1982) described how CIP (Centro Internacional de la Papa) researchers learned about diffused-light potato storage from African farmers and spread it to Latin America and Asia. (Unfortunately, this early example is still one of the few concrete technologies developed by FPR.) In a remarkable article, Biggs and Clay (1981) outlined many of the issues in farmer participatory research that are still current, such as the importance of linkages between farmers and scientists, genetic erosion, and the potential contribution of farmers in relatively small agroecosystems (and may have been the first to apply the term "participation" to agricultural R&D). Many others, like Robert Chambers (1983) and Roland Bunch (1985), have also contributed to the concept of farmer participation in agricultural research.

ITK and Cultural Ecology

The value of indigenous technical knowledge (ITK) and traditional farmer practices were understood before scholars placed much emphasis on farmer experiments (see, for example, Brokensha *et al.*, 1980; Conklin, 1957; and Berlin *et al.*, 1974). Chambers (1983: 85-95) reviews many other primary sources on ITK. Anthropologists and geographers had painstakingly documented indigenous food-getting technologies and ecological knowledge and presented them in a light sympathetic to peasants and tribal peoples (Evans-Pritchard, 1940; Steward, 1955; Leach, 1968; Netting, 1968, 1981; Rappaport, 1968; Johnson, 1971; Cancian, 1972; Hunn, 1977; Wilken, 1977, 1987; Durham, 1979; Denevan *et al.*, 1984; Forde, 1949 and many others). However, a comprehensive inventory of cultural ecology is beyond the scope of this introduction (see Netting, 1986; Ellen, 1982). Although long under-appreciated, Norgaard (1987) credits cultural ecology with providing the philosophical underpinnings of agroecology, a new discipline consistent with FPR.

Interest in FPR Was not Motivated by New Knowledge

There was enough information about ITK and farmer experiments to have led agricultural researchers to FPR some years earlier. Before the first programmatic statements about farmer participatory research, other writers were trying to call attention to the creative power of peasant farmers, including the American anthropologist Allen Johnson (1972) and the soil scientist Hugh Brammer (1980). In 1941, in Mexico, Carl Sauer cautioned against a policy of rapid technical modernization, arguing that any program of technology generation should begin with traditional peasant knowledge. He was ignored (Bebbington, in press). A well-known anthropologist, Allen Johnson, documented farmer experiments in a prestigious journal in 1972. He was one of the first to even notice that peasant farmers experimented with their cropping systems and that they did so routinely. He went uncited and largely unread until his paper was belatedly discovered in the late 1980s. Johnson's work should have been a milestone in anthropology. Anthropologists had argued over the diffusion of technology and culture change, but had not given much attention to invention, except in archaeology where the origin and spread of classic technologies (like the sickle) had to be accounted for. However, cultural anthropologists tended to see technology as a dichotomy of traditional versus introduced and paid little attention to the original ideas of contemporary farmers. Johnson's descriptions of farmer experiments in his widely read monograph on small-scale farmers in Brazil (1971) could have served just as well as Richards', Rhoades', or Biggs' work to kindle interest in FPR, but anthropologists and the development community weren't ready for the idea that farmers do experiment.

Dissatisfied with the Green Revolution

Stimulating and valuable as it was, Richards', Rhoades' and Biggs' work may not have been the only reason that farmer participation and interest in farmer experimenters suddenly came into vogue. As Gould (1977) points out, scientific theories are not usually built up bit by bit from the data, but are usually proposed for social and political reasons and then old data is discarded and other data marshaled to suit the new theory. "Information always reaches us through the strong filters of culture, hope and expectation (Gould, 1980: 118)."

The current strong interest in FPR was conditioned more by dissatisfaction with formal sector agricultural research than by new information about the value of traditional farmer knowledge. By the 1980s the green movement was growing strong (Redclift, 1984). Capital- and chemical-intensive agriculture was being criticized (Altieri, 1987; Granatstein, 1988; Murray and Hoppin, 1990; Thrupp, 1988). The United States Agency for International Development (USAID), the Food and Agricultural Organization (FAO), the World Bank, the International Monetary Fund (IMF) and other industrial country aid agencies were being discredited for benefiting the wealthy more than the alleged beneficiaries (Hayter and Watson, 1985; Linear, 1985; DeWalt, 1985, 1986; Stonich, 1989; Hancock, 1989). The achievements of the green revolution were being seriously questioned (Altieri, 1986; Cleveland and Soleri, 1989; Crist, 1983; Chambers and Jiggins, 1987; Gómez-Pompa *et al.*, 1982; Hunter, 1981; Lansing, 1987; Pimentel and Goodman, 1978; Waters-Bayer, 1989). FPR promised to be an alternative to socially and environmentally insensitive R&D.

Section Summary

ITK was documented before FPR. Publications about farmer experiments appeared about ten years before the first programmatic articles on FPR, but failed to generate much interest and were uninfluential in early writings on FPR. Interest in FPR was probably motivated more by dissatisfaction with green revolution and capital-intensive agriculture than by FPR's ability to innovate technology.

The failure of FPR

Because FPR was not built on a foundation of many successful experiences it has had problems. A review of 25 case studies of FPR show that sustaining farmer participation beyond initial, diagnostic stages was more difficult than researchers had anticipated. In most cases, the participation of farmers in FPR was relatively passive. There were very few examples of farmers and scientists working as colleagues (Merrill-Sands *et al.*, 1991).

FPR's emphasis on land-poor farmers, "empowerment" of peasants through respect for ITK (Thrupp, 1989) and its small-scale approach give it a certain romantic appeal. FPR became the heir of farming systems research (FSR) and appropriate technology movements. Once leading scholars made FPR a topic of discussion, many who had little experience collaborating with farmers rushed to add an FPR paper to their résumés. Amanor (1989) listed 340 abstracts on the subject by 1989. Although writing papers on FPR has become an academic cottage industry, FPR has had little effect on the agricultural R&D establishment, which goes about business as usual. "As we enter the 1990s, the dominant paradigm of development expressed by normal professionals and implemented through normal bureaucracy is still top-down and centre-outwards (Chambers, 1990: 3)." Nickel's (1989) book on how to manage an agricultural research center, taken as a sample of thought from the agricultural establishment, expresses respect for FSR, but ignores FPR and cautions against over-enthusiasm about the value of "peasant wisdom."

A recent anthology demonstrates that farmers and other rural people invent technology on their own (Gamser *et al.*, 1990). However, there are still few reports in the literature of technology invented by formal scientist-farmer interaction. Most papers on FPR include no data, no description of technologies generated with farmers and no description of the method used or which scientists participated and how. Some even fail to mention which crop was under study. Most read like reports on non-experiences. Despite its promising subtitle, "*Farmers' Participation in the Development of Technology*," none of the papers in the Matlon *et al.* (1988) volume mention a technology developed *with* a farmer — except for Rhoades (1988), who again writes about diffused light potato storage. Few of the papers in the book *Joining Farmers' Experiments: Experiences in Participatory Technology Development* (Haverkort *et al.*, 1991) actually discuss a technology developed by farmers and scientists working together. One of the few is a description of an herbal sheep dip invented by Andean farmers working with researchers (Fernandez, 1991). In all fairness, I also coedited a volume on FPR which described little new technology (Bentley and Cáceres, 1990). Working with farmers was a nice idea, but easier said than done.

Becoming farmers' colleagues may be difficult, but is not impossible. Lightfoot *et al.* (1988) wrote one of the few articles to describe a technology invented by farmers and scientists together; they discovered with farmers that the broad leafed plant *Desmodium ovalifolium* could be used to shade out *Imperata* sp. grass. Their article is unusual in the FPR literature in describing scientist-farmer interaction in some detail. Bentley and Andrews (1991) describe an experience Keith Andrews had in 1983, developing a slug trap with farmers, made from cut weeds. However, since this "trash trap" technology requires more labor than farmers are willing to spend it has not been widely adopted (Andrews and Bentley, 1990; Bentley and Andrews, 1991; Shaxson and Bentley, 1991).

A brief article on citrus ants (*Oecophylla smaragdina*) Fabr. in China by two entomologists is full of references to farmer inventions and unselfconscious farmer-scientist interaction. Huang and Yang (1987) learned how villagers in one area rescued the vanishing art of ant cultivation to control insect pests. Farmers invented cement rings to keep the ants in the trees and shelters so the ants could survive the winter. In another village farmers taught the scientists that ants naturally survive the winter in pomelo trees, which are leafier and provide more shelter than orange trees. The entomologists suggested that the growers move the ant nests to pomelo trees from orange trees before the orange harvest. The villagers tried the idea and saved more ant colonies. The paper is about biological control of insect pests, not about scientist-farmer relations. The authors were apparently unaware of FPR *per se*. Cuban scientists have also designed a biological pest control strategy using ants, based on a traditional peasant method. Rosset and Benjamin (1993) describe the technology in detail but are vague about how it was developed. Perhaps few scientists work with farmers because it requires scientists who have freedom from campus duties, the humility to learn from farmers, the ability to teach them, and the creativity to synthesize formal and informal research. However, it has been my personal experience that agricultural scientists are at least as humble and teachable as social scientists. It is also possible that most traditional agricultural scientists are unwilling to abandon on-station research in favor of seeking farmer colleagues, when FPR has not proven itself by generating new technologies. One reviewer of this paper was unconvinced that FPR has developed few technologies and was concerned that I had not cited more literature from the 1990s. I could have cited many recent FPR papers as having failed to discuss concrete results of their research. People don't like to be cited that way and they don't deserve to be singled out for criticism just because I read them. I have presented the best FPR research I am aware of, and there is little in it to rival techniques invented by scientists (hybrid seed, agrochemicals, genetic engineering) or by peasant farmers (domestication, organic fertilizer, basic farm tools).

That same reviewer misunderstood my emphasis on technology generation and asked why not use sustainability or extension as the yardsticks for measuring FPR's success. Some authors explicitly call FPR "participatory technology development" (Waters-Bayer, 1989). If FPR does not generate technologies, FPR will have no technologies to extend and no techniques that can be judged sustainable. The task of agricultural research is, well, research. More like engineering than pure science, the goal of agricultural research is new technology. It does not exist to validate scientific knowledge or to empower scientists (although those may be side results). We cannot judge farmer participatory research by any other standard than its ability to generate useful new techniques for rural people. It should not be a roundabout way of making people feel good about themselves or becoming politically organized. Those are worthy goals, but they should be tackled directly instead of being masqueraded as technology development.

Most of the FPR articles that document technology merely discuss experiments with very simple technologies like new crop varieties (Ashby *et al.*, 1989a, 1989b) or fertilizer (Ashby, 1987; Ashby *et al.*, 1987; Matlon *et al.* 1988) that farmers try on their own anyway. The commercial sector figured out years ago that farmers will experiment with chemical fertilizer and in Portugal it used the tendency as part of a marketing ploy. Agrochemical vendors gave away one kg bags of fertilizer at country fairs in the 1930s and returned the next year to sell 50 kg bags. Fewer scholars have worked on topics like pest control, where farmers' understanding is limited. As Heong *et al.* said of farmers in the Philippines, "Their pest identification skills were poor and knowledge about the role of natural enemies and natural control are even poorer" (Heong *et al.*, 1992).

Why FPR Is Not Working

We should have expected FPR to be difficult, if for no other reason than because it is hard to get scientists and farmers together. Chambers (1983) writes that researchers often have limited access to representative farmers because scientists stay close to cities, visit farms under the influence of specific projects, stay on the paved highway, travel during the dry season, and talk to men, especially the wealthier ones. Class, ethnic, gender, geographical, economic, and linguistic differences between scientists and small farmers mean that their interaction is easier said than done. FPR by development tourists (see Chambers, 1980) without the time or ability to collaborate with farmers has little chance of solving agronomic problems.

FPR is not failing for lack of farmer creativity. Farmers experiment constantly (Bentley, 1989a, 1990a, 1991, 1992; Bentley and Andrews, 1991) and extend technology spontaneously (Bentley, 1987). Farmers in Honduras and many other countries habitually experiment with new seed varieties (Altieri, 1987: 75; CIAT, 1989; Conelly, 1988; Farrington and Martin, 1987; Kerr and Posey, 1984; Matteson *et al.*, 1984; Maurya *et al.*, 1988). Many other experiments and inventions by rural people have also been documented (Biggs, 1980; Brammer, 1980; Estorninos and Moody, 1990; Gamser *et al.*, 1990; Richards, 1989a). All farm animals and crops (except triticale) were domesticated and many agrarian implements (the plow, wagon, sickle, and others) were invented before the invention of writing or the rise of cities. Thus the most important agricultural inventions bear witness to the creativity and intellect of illiterate villagers (Rhoades, 1989; Biggs and Clay, 1981). European peasants carefully adapted plow types to fit microenvironments. The many different plow types that Oliveira *et al.* (1983) map for Portugal show that there are many small environments to which technology must be adapted and that the plow types (variations on a few basic designs) were conceived by local peasants.

At least in some cases, farmers do better when left alone than when outsiders interact with them. Netting *et al.* (1989) argue that indigenous agricultural development by Kofyar farmers in Nigeria (producing native food crops for the urban market) happened because government planners and scientists ignored the Kofyar, who were free to evolve new cropping systems based on new land, previous experience, local experimentation, roads, and an open market. Chapin (1990) reaches much the same conclusion in Mexico; the few successful ecodevelopment projects he visited were ones without scientist participation.

Barriers to FPR

Seven basic problems limit scientists' ability to collaborate with farmers: poor access, different observation and experimental styles, time constraints, environmental mosaics, and social distance.

1. Farmers are difficult for scientists to reach. Most peasants live several days' journey from agricultural researchers. A common way around this problem is for scientists to work with farmers in nearby, accessible villages. I know one farmer who collaborates with five different scientists. Their influence on him means that he is not representative of Honduran farmers.

2. Farmers and scientists have different observation styles. Farmers observe the natural environment as they work, while scientists observe to fulfill an academic agenda. For example, malacologists place slugs in plastic boxes and offer them different foods to see which ones the mollusks prefer and which they reject; concluding that the common bean slug (*Sarasinula plebeia*) eats a wide variety of broadleafed plants, including beans (Andrews *et al.*, 1985). When I asked Honduran campesinos what bean slugs eat, some responded that they eat maize kernels. At first glance this answer seems bizarre, because bean slugs refuse maize and other grasses. However, a slug does occasionally find its way into a maize ear, where it may nibble a few grains. Farmers harvesting maize by hand are not likely to forget finding a tough, slimy slug in a maize ear.

3. Farmers and scientists have different experimental styles. Scientists plan experiments in advance. Farmers often make theirs up as they go along. I met one Honduran farmer who could not get a tractor to plow his land one year and so planted his beans later

than usual. He considered this an experiment and took advantage of it to see if late planting would lower slug attacks, although it was not a planned experiment (see Stolzenbach, 1993 for a similar case). As in most farmer experiments, there were none of the formal trappings that agricultural scientists consider essential to distinguish an experiment from a mere production experience: a control treatment, replicates, randomization, and numerical data. Farmers generally try one thing at a time, over a whole field. Scientists divide a field into subplots, often blocks and replicates. The farmers' replicates are over time; one year after another. The farmers can't be bothered with filling their fields full of stakes and twine. Planting and other chores take more time in many sub-plots. Occasionally farmers compare a handful of a new seed variety in a field with the variety they normally plant, but a simple mark — what Honduran farmers call a "sign" (*seña*) — an old cornstalk or a stick placed between two rows, is enough to separate the treatments.

4. Farmers and scientists have different economies. Farmers are not overly interested in any household economy other than their own. If an innovation works for them they can easily judge its value qualitatively. Thus farmers are not interested in whether or not results from an experiment can be extrapolated beyond their farm. Applied scientists are supposed to do research that addresses broad, significant problems and search for solutions that are applicable over areas large enough to justify the research expense. Scientists use specific experiences to generalize and extrapolate. Although farmers live from the land, scientists live from their salaries, which are not closely correlated with their productivity. But scientists earn prestige from publications, which must usually include numerical data. Farmers could care less about the numbers and may harvest an experiment before the scientist collects the data from it (see Matlon, 1988). This may explain some of World Neighbors' success; their promoters are generally from the areas where they work, and are not scientists (see Chapin, 1990; Andrade, 1990).

5. Scientists aren't Peace Corps volunteers. They have other things to do besides work with farmers. Family, laboratory work, writing, teaching, on-station experimental research, reading, administration, writing memos, committee work, organizing and attending symposiums, "networking" with each other, and updating their résumés all compete for their time.

6. There are many local natural environments, each with unique research needs (Biggs and Clay, 1981; Horton, 1984; Andrews and Bentley, 1990). When colleagues and I asked farmers in 13 villages in Olancho, Honduras, what their problems were in maize, most mentioned maize ear rots (a complex of fungal diseases, especially *Stenocarpella* spp. and *Fusarium maydis*) or whorlworm (*Spodoptera frugiperda*) (J. E. Smith) (Lepidoptera: Noctuidae), but farmers in the village of El Bebedero described an odd disease they called *canícula*.[1] They said in a drier year, whole maize fields failed to develop brace roots, the plants grew onion-like roots and fell over in the first strong wind. Agricultural research takes years and no scientific team has the time and money to study a disease that is limited to one village, no matter how important it is for that village.

7. Perhaps the greatest single reason FPR has failed for small farmers is social distance between farmers and scientists. How else to explain the success of FPR in the commercial sector, where farmer-scientist collaboration has always been standard practice, whether the farmers are almond growers in California or transnational banana companies in Honduras (Andrews, 1990). Another example comes from an African palm corporation in Costa Rica, which has several Ph.D. level researchers and four large farms. Twice a year everyone in the company meets to discuss technical topics. Company leaders often discuss research goals and progress among themselves. The production staff collects some of the data. Collaboration between research and production personnel is eased by many informal, social links between them. Successful experiments are tried out on a larger plot and from there new technology is adopted on a large scale by the production sections, usually with no further adaptation needed (Nidia Guzmán, personal communication, 1991). Assuming that the employees of multinational agricultural firms are farmers, this case suggests three important factors present in commercial FPR that are missing from small farm FPR: 1) there are structural, financial relationships between farmers and researchers. Management sees that researchers study the topics of interest to production sections. 2) The commercial farm is powerful, organized, and concentrated, so extension flows naturally, almost automatically, from research. 3) Commercial sector farmers and researchers share the same class background. They often live in the same communities, send their children to the same schools and may be personal friends. Following Paul Richards' (1989b) analogy of agriculture as performance, the relationship of agricultural scientists to small farmers may be like music critics to solo folk artists, but in large-scale, commercial agriculture scientists and growers play in the same orchestra. No matter how sensitive social or agricultural scientists are to small farmers, researchers are rarely as intimate with villagers as commercial-sector scientists are with their colleagues in production.

A Role for FPR?

Despite the underwhelming success of FPR it is too soon to abandon it. But it is time to take a more critical look at FPR, decide what it can and cannot do, what are the conditions of its success and how can it actually be done.

There are several valid reasons why scientists should keep trying FPR. First, researchers can learn traditional technologies to validate and retool them for today's conditions before the old practices are lost completely. Thurston (1990) documents many such techniques, including bending the mature maize plant, which protects against fungal diseases in many Latin American countries.

Second, although farmers are ingenious experimenters, they can easily get into trouble with agrochemicals. Farmers in Burkina Faso had been taught to use insecticides in stored grains and so began experimentally mixing highly toxic herbicides and insecticides into stored grain (Vierich, 1988: 23). Farmers in Ghana have experimented with insecticides as fish poison in streams (Linear, 1985:96). I recently watched a Honduran campesino spray a small field with paraquat. He had fashioned small covers from the trunks (stems) of banana plants to shield his maize seedlings, so he could spray a contact herbicide without killing his crop; an ingenious experiment with a dangerous chemical. The man smoked as he worked, bringing the herbicide to his lips. He and his two small sons moved the banana trunk pieces from row to row with their bare hands. Farmers in industrial countries are also vulnerable to pesticide maladaptation. English farmers poison themselves with pesticides at alarming rates (Tait, 1983).

Setting Research Agendas

Peasant farmers should be called upon to set research agendas for formal agricultural research (Aboyade, 1991; Farrington and Bebbington, 1991). Keith Andrews (personal communication, 1991) goes one step further: farmers should not be involved in actual experiments, just in setting research agendas and scientists should then report the results back to them. Farmers should set strategies and establish some evaluation criteria, then do "quality control" on the scientific program, helping to redirect it and decide when extension should begin.

A Full-Time Job

Farmer participation may work for students, nongovernmental organizations, and others who can live and work in remote villages (see Andrade, 1990; Bunch, 1990). Unfortunately, these people often lack the technical agronomic knowledge to do formal scientific research. Most of the successful work by World Neighbors has been with the adaptation of simple technologies and not technology generation (Chapin, 1990). Perhaps the key to farmer participation is that scientists should work with farmers through intermediaries who live in remote villages and can serve as information brokers between scientists and farmers.

Not for Beginners

Farmer-scientist interaction is perhaps an art requiring special gifts. This does not mean it is impossible or should be discarded. Flying a 747 and playing concert piano are also difficult, but with extensive training some people manage. Few agricultural scientists will struggle to learn FPR if the reward is to go apply it in a remote village, with few job and school opportunities for ones' family. For example, a prestigious International Agricultural Research Center recently set up a (participatory, sustainable) project on the North Coast of Honduras. A very good, mature Latin American agronomist was chosen to head the project. He moved his family from South America, but not to Honduras. They set up house in San José, Costa Rica — two countries away from Honduras. He will commute by plane to his work site. If it is difficult to get scientists to locate in small Caribbean cities imagine trying to hire a mid-career scientist to work full-time in a typical peasant farm village.

My colleagues and I have had some modest success with FPR (Bentley *et al.*, 1994). Preparing for the experience took four years of learning both the scientists' and the farmers' perspective, including two years living and working in a peasant village, while trying and failing to innovate technologies with farmers (Bentley and Melara, 1990, 1991) and by training ourselves to be extension agents (Bentley and Andrews, 1991; del Río *et al.*, 1990). After these preliminaries the actual research took an anthropologist, two agronomists, four NGOs and over 600 Honduran farmers working for two years. The results include a few techniques invented by campesinos to control pests without pesticides (Bentley *et al.*, 1994). This has encouraged us to expand the work to include 14 agronomists, entomologists, and social scientists, several NGOs and thousands of farmers in Honduras, El Salvador, and Nicaragua.

Part of our success has come from filling in key gaps in farmer knowledge and then leaving farmers alone while they create solutions. Yabar (1990) reports a somewhat similar case from Bolivia. Andean villagers had no idea that the grubs that attacked stored potatoes were the offspring of weevils. After outsiders explained this relationship, villagers were able to control the weevils in their adult stage, which the farmers had previously ignored.

Sperling *et al.* (in press) report a successful case from Rwanda, where varietal development takes up 80-85% of the research budget of Rwanda's institute of agricultural science, but farmers soon abandoned these varieties. Farmers were only growing 10% of 50 bush bean cultivars that had been released and most of those were on the decline. Varieties selected by farmers for early release were grown for more years than finished varieties. Findings like this can save research institutes a great deal of money, while giving farmers the varieties they need. This project was also based on years of work and involved farmers in one of their areas of expertise: selecting the germplasm that farmers value.

Document FPR Experiences

Social scientists with no agronomic training are ill-equipped to innovate new technologies, even with the assistance of farmers. However, social scientists are ideal for documenting FPR experiences. We need more nitty-gritty accounts of FPR that discuss the problems of the work and which of those problems were solved and how: Fujisaka (1993) writes one of the few critiques of an individual participatory technology transfer program.

Conclusions

FPR has generated a large body of vague, uncritical literature that reports very few new technologies (see Tripp, 1989). Thus, it has so far been a poor research strategy. Farmers are knowledgeable and innovative but agricultural scientists are either unable or unwilling to do FPR, or are unconvinced of its value. FPR may have more value setting research agendas or when done with NGOs. FPR takes time and skill and cannot be done by development tourists. 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. Neither green revolution technologies nor traditional agriculture are capable of feeding the world for much longer (Cleveland, 1993). We desperately need alternative styles of generating new technologies before we eat the Earth bare. FPR needs to be stripped of its romantic, moralistic overtones and judged as any other tool for innovating new agricultural technology.

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Notes

1. In Honduran Spanish *canícula* denotes the short dry season every August that interrupts the rainy season. The people of El Bebedero had observed a relationship between dry weather and the disease and so called the disease *canícula* as well.

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