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1.4 Scientists' views of farmers' practices in India: barriers to effective interaction

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Researchers' attitudes[4]

In a recent study based on field work in semi-arid parts of Western India (Gupta, Patel and Shah, 1987), we asked a number of biological scientists to narrate any farmers' practices which had intrigued them. Our purpose was to understand whether the scientists, often blamed for ignoring farmers' innovations, were really unaware of them.

The sample included 61 scientists (24 from the All India Coordinated Research Project on Dryland Agriculture – AICRPDA, Hyderabad, 24 from Haryana Agricultural University, Hissar and 13 from the University's Dryland Research Station at Bawal). They were from different disciplines, ranging from plant breeding, genetics and agricultural engineering to agroeconomics and sociology. The main method of eliciting information was to interview the scientists with the help of a structured schedule of questions.

Several variables may influence the way in which a research community perceives the knowledge of peasant farmers, including the scientists' values, assumptions about the nature of scientific knowledge, dislike of simple technological alternatives, unjustified assumptions about the farmers' constraints and opportunities (Sanghi, 1987) and the urban 'tarmac' and related biases identified by Chambers (1983). In this study, the ecological background from which the rural-born researchers came was also a factor, as was professional training and disciplinary background.

In this sample, 24 of the 61 scientists did report unusual practices by farmers, and it was striking that these were mostly scientists from Hyderabad. Their observations can be classified as:

- sceptical;
- critical of the practices considered sub-optimal, or
- unscientific; and
- acknowledging that the practices are useful and innovative.

A limited number of examples are given in Table 1.1.

Table 1.1: Some typical responses of scientists regarding farmers' innovation and practice

Cryptic answers and sceptical comment
• 'Old farming practices are ... well tested. But a practice which was simple and good 50–100 years back may not be good in present circumstances. And a practice which is good today may not be good tomorrow. Every farmer's practice needs to change ... with time.'
• Farmers 'are not maintaining any record so when asked for previous practices they couldn't recall the actual performance, eg how much labour used in different operations'.
• 'I have not noted any interesting farming practice.'
Sub-optimal resource use or ignorant of alternative land use
• 'Use of less seed and fertilizer than the recommended quantity.'
• 'Moisture conservation practices are not adequate in rainfed areas.'
Apparently unscientific practices
• 'Some farmers do not till the fields during the fallow winter season because of the belief that soil will catch cold if ploughed then.'
• 'Sowing of seed of some crops mixed with fertilizers.'
• 'Farmers follow up-and-down cultivation methods without consideration of slope, so there is a risk of soil and water erosion.'
Acknowledged as innovative practices
• 'Growing of sarson (mustard) in criss-cross sowing in the gram crop.'
• 'Use of NAFE (a desi (traditional) plough) for deep sowing of gram by camel.' (Also other uses of traditional ploughs for sowing gram and mustard.)
• 'In some villages of Hissar and Sirsa districts farmers use a blade hoe for preparation of the seedbed. It is a very useful implement as it saves time, labour and at the same time conserves moisture.'

It should be noted that these scientists have rarely investigated the reasons for the practices they mentioned. Thus the science underlying rational practices and the myths behind not-so-scientific practices have not been understood. We want to state unambiguously that the mere

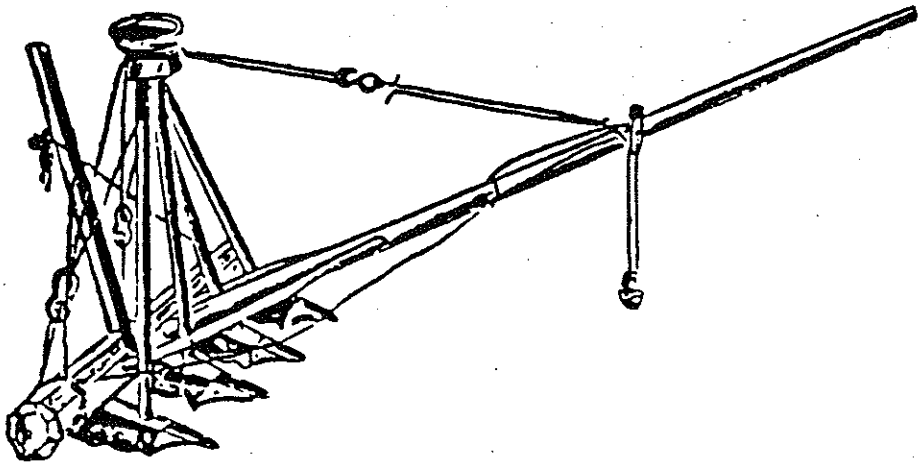

Figure 1.2: *Four-row seed drill as used in South India in the eighteenth century. This example was sent to England in 1795 or 1796 by Captain Thomas Halcott with the comment that, 'here is a remedy for the defect complained of in the English drill plough'. The illustration was published in* Communications to the Board of Agriculture, *London, 1797 (Dharampal, 1971: 211, 213)*

documentation of peasant practices is not enough. We have to identify the scientific basis of peasant practices and link it with their rationality. This view is linked to our plea that *science* should be transferred to the farmer and not just *technology*, so he knows the reasons for what is done and is better placed to improve his practice.

The importance of this can be illustrated by reference to the state of Indian agriculture in the eighteenth century as recorded by British travellers. One of them commented on the bullock-drawn seed-drills used in India (figure 1.2), noting that seeds were spaced at definite intervals along the rows. These implements surprised him because in England, the seed-drill was regarded as a recent invention, over-complicated and still unreliable. The Indian device had been in use for longer and was much more satisfactory (Dharampal, 1971). One reason why this technology did not advance in the East as rapidly as it subsequently progressed in Europe may well be the lack of a link with science – or at least the lack of interaction between farmers and those who wrote books about botany or agriculture. Indeed, the ground rules for classifying peasant knowledge and linking it with scientific method still need to be developed.

Extensionists' attitudes[5]

In a workshop of scientists and extension workers organized by Nurul Alam and his colleagues from the Bangladesh Agricultural Research Institute (BARI)[1] and Rafique Ahmed of the Directorate of Agricultural Extension, Bangladesh, extension staff were asked to list those farming practices which they considered most intriguing. They were not to judge the efficacy of these practices, since it was acknowledged that they would

all need to be tested before being considered worthwhile. A wide range of practices emerged, as indicated in Table 1.2.

Table 1.2: Farmers' beliefs and practices reported but not tested by staff at the Department of Agricultural Extension, Tangail, Bangladesh

No	*Staff member reporting*	
1	Subash	Opium insertion in bottlegourd stem increases the number of fruits
2	Feroz	Non-bearing papaya bears fruit when injected with cholera vaccine
3	Feroz	If non-bearing bottlegourd vines are given a longitudinal incision they start bearing fruits
4	Awlad	Sowing of jute after the full moon in chaitra is considered optimal
5	Awlad	Powder of neem fruit used in paddy to control pest
6	Murshid	Urea is used for controlling stemborer in Boro paddy
7	Hoque	Broadcast ash over paddy to control insects
8	Sayed	Juice of Talakachi leaf mixed with water and sprinkled on leafy vegetables helps in the control of beetles
9	Alam	If jute is grown after wheat, a nodular substance in jute roots leads to mortality of the seedlings
10	Murshid	Laddering in wheat increases tillering at 20–25 days after sowing
11	Feroz	A longitudinal section cut after the dark phase of the moon of Bhadra or Shin in Jackfruit helps to encourage bearing of fruits
12	Alam	The banana plant is used for rat control in wheat (the rustling of leaves creates sounds which keep the rats away)
13	Awlad	If 'Shazna' cuttings are planted after the first shower in the chaitra, bearing starts within one year

We did not want the reporter of a practice to certify its reliability or the generality of its application, since this could have led many people to keep quiet. Under these conditions, even the District Agricultural Officer and other senior members of the workshop contributed, the philosophy being that if somebody could not cite any practice, then he had wasted his life!

We considered it impossible for anyone to work with farmers and not notice innovations or unusual practices at some time.

However, on the day following this exercise, we circulated the list of innovations with the names of the reporters, as in Table 1.2. There was strong scepticism when we announced that each innovation would be credited to the reporter. We noted embarrassed smiles on many faces when we actually did it the next day. Participants had probably thought that here was another snake charmer taking them up the garden path. This perhaps reflects the lack of credibility that we, the social scientists, have with grass-roots workers.

In a further exercise, Alam and his colleagues attempted to explore the beliefs and hypotheses which observed practices seemed to reflect. A list of these beliefs was incorporated into a questionnaire so that farmers could be asked with respect to each one whether they agreed strongly, agreed with qualifications, disagreed, or did not know. For example one of the beliefs listed in Table 1.2 is that the sowing of jute after a full moon in the month of chaitra is considered optimal, so a question was included about sowing time for jute relative to the lunar month.

The purpose of this work in Bangladesh was to get behind the myths associated with local knowledge and 'scout' for practical innovations. To this end, the scientists also had night meetings with farmers in the villages to discuss many of the innovations. They aimed to speak with older people separately from the younger generation in order to tap knowledge which the latter might despise.

Attitudes toward homestead gardens[6]

In another exercise which pained the biological scientists almost as much as the previous two, we tested their beliefs about the benefits of homestead gardens. The issue was that the horticultural department of BARI wanted to do a survey of homesteads in different parts of Bangladesh. They had drawn up a detailed questionnaire and consultants from an international centre doing research on vegetables had reinforced their view that only experts in the subject could decide what questions to ask.

However, when I was approached, I had to express helpfulness, but I also asked, how could one improve the questionnaire without understanding the purpose of the survey, and the assumptions behind it? For biological scientists to be asked such things by a social scientist was disconcerting. Nevertheless, we had a meeting during which three statements were made very assertively by the scientists:

- households use the homestead space and other resources very inefficiently;
- they plant most of the trees, bushes and vegetables randomly, or just let the plants grow where they come up;
- they grow most trees for a single purpose, eg, fuel or fruit.

Once these assumptions had emerged, it seemed desirable to test them before moving further and a programme for doing this was drawn up consisting of the following steps.

First, a team of women scientists contacted a few poor women 'homestead managers' near the Institute.

Second, a map of all the fixtures on each homestead was prepared identifying each tree, vegetable and bush, spaces for tying animals, waste disposal sites, and so on. It was found that some scores of species of plants were grown (up to 70 species being noted in a later case study in Tangail District), with up to 40 being found at a typical household, including fruit trees, vegetables, herbs and shrubs.

Third, a discussion was held in which we asked why some species were found in greater numbers than others, analysing possible reasons in terms of the three coordinates of space, season and sector.

Fourth, multiple uses of different plants were noted in order of importance (eg, fruit, fodder and fuel from one tree).

Then a meeting was held in which those who spoke about the haphazard and random nature of the homestead biomass were asked to explain and interpret the homestead map. It was recognized, after long discussion, that the homestead planting was so complex that no firm conclusion could be drawn, with the available information. But there did seem to exist some order in what had been assumed to be disorder.

It was then decided to pursue a more detailed and more wide-ranging study with the help of some 28 women scientists from other divisions of the institute, most of whom did not normally work together. It was assumed that most decisions about homestead gardens were taken by the women in the homesteads and thus women scientists would have to help if adequate information was to be obtained, but it turned out later that the decision to leave self-sown tree seedlings intact, or alternatively to uproot them, was generally made by men, while vegetables and medicinal plants were tended by women.

The women scientists went out to different parts of the country to develop case studies and a large number of innovative practices emerged. Results were discussed with male field scientists, but it was suggested that gender-specific issues needed to be examined from a different point of view. The role of women in the homestead needed to be understood in terms of their own specialist knowledge and not just by regarding them as exploited workers who contribute to post-harvest chores. I consider the efforts by researchers on gender issues to spend major energy on finding out time-task allocation misplaced. It is the technical and institutional knowledge unique to women managers of homestead farms which must be built upon. Later there was considerable consternation because the results of this survey were analysed by male scientists without involving the women scientists who had done the fieldwork. What was still more frustrating was the decision of the concerned male scientists not to include these women researchers in designing a follow-up homestead management study.

The researchers' previous assumptions about inefficient land-use were then examined in relation to apparently unused space in homesteads which a horticulturalist thought could be used for growing vegetables, provided that they were watered during the winter. However, water was a scarce

resource which was needed for washing cattle (who may get diseases otherwise), for personal hygiene, cooking and drinking as well as for irrigation of existing vegetables and trees. So not using water for planting extra vegetables was after all not a bad decision and certainly not a proof of irrationality.

Issues arising[7]

This exercise revealed barriers to interaction and understanding between senior scientists and extensionists, between female and male scientists and between biologists and social scientists, as well as between farmers and scientists. Aggravating the situation as far as the horticulturalists and biologists were concerned was pressure from donor agencies to start work without waiting for the results of the survey. This is mentioned to highlight the fact that in many developing countries, one should not assume that lack of innovative research is caused by lack of focus or proper methods.

A further implication of research with marginal farmers or women gardeners is the marginalization of the researcher himself or herself. We urge concerned scholars to note that since the majority of scientists are never likely to want to work with poor farmers, or become accountable to them, the dynamics of minority action need to be well understood. The minority who do work on these themes needs to be sustained in the short-run if better and more liberating forms of research are to emerge in the long run. If we ignore these issues, we will be in danger of creating a new myth of 'harijan scientists', who are close to God because they work with the poor, but who can be ignored for the time being because they are not close to God's creations, the men with power.

Finally, and most importantly, we must confront the ideas of the natural scientists who object to farmers' involvement in research but admit that the farmers do make some valid points. For example, it is partly justified to say that farmers are sometimes poor because they have not been able to innovate fast enough to keep pace with changing circumstances and the accumulation of new knowledge. It is also true that farmers who cannot read or write or keep records are handicapped when it comes to comparing current crop yields and labour requirements with what they achieved in the past.

However, the question which is most serious and which we hear most often from the senior agricultural research leaders is, have we not delivered the goods so far using our own methods? The implication is that more of the same will do. This misconception led many research planners to apply Indian wheat and upland irrigated rice experience in Africa without much success. Within India, the oilseed mission makes the same assumption. We are not questioning that some of the germ plasm which has been found good for high input environments may also be useful under stress environments, but we would argue that because the survival options of poor households in the latter area are so circumscribed, the research approach and agenda must be different. The success of modern wheat and rice varieties has resulted in some conceptual blinkers. In the different

context of stress environments, where nature is more hostile and the demand for technological change is feebly articulated by poor farmers, work with the farmers becomes especially important.

A point which must not be missed in context of matching farmers' concerns with that of the scientists relates to the ability of farmers to *demand* what they *need*. Too much emphasis on responding to only the articulated demands of farmers may reduce the zone of responsibility of the scientists. It has to be conceded that farmers may not *demand* what they do not know or imagine can be supplied by scientists.

The limits of what scientists can do to help people in high risk environments need not be defined. It is not what people can demand but rather by what they *need*. Defining the needs of 'others' as well as one's own requires making value and moral judgements explicit – perhaps we have not done enough towards this.