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Use of Participatory Exercise for Modelling the Adoption of Organic Agriculture

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Abstract: Participatory methods may prove helpful at the exploratory phase of developing a working adoption model for organic agriculture. A study carried out in selected areas of West Bengal, India employed innovative participatory methods for identifying farmers' perception regarding the attributes of organic agriculture and several farm- and farmer-related factors. Analysis of participatory exercises facilitated the development of a potential pool of factors that may be used for developing an effective adoption model for organic agriculture. The process helps develop econometric models that study the transition of chemical agriculture to organic agriculture.

Introduction

Diffusion of innovations refers to the spread of abstract ideas and concepts, technical information, and actual practices within a social system, where the spread denotes flow or movement from a source to an adopter, typically via communication and influence (Rogers, 1983, 1995). The adoption/diffusion model developed in the United States by rural sociologists attempted to predict the adoption behaviour of individuals by looking at their personal characteristics, the time factor, and the characteristics of the innovation itself (Padel, 2001). But this model was developed at the height of productivity paradigm for agriculture and "green revolution," and now faces serious criticism for its inability to study environmental challenges in agriculture (Buttel, Larson, & Gillespie (1990).

As organic agriculture takes center stage to overcome farming-related environmental pollution, the adoption of organic agriculture is expected to remain an important area of empirical study in the near future. A string of adoption studies on organic agriculture across the globe vindicate this observation (Padel, 2001; Rigby & Caceser, 2001; Knowler & Bradshaw, 2007). Other important empirical results come from Padel (2001) ("motives of the farmers" to convert to organic production); Darnhofer, Schneeberger, and Freyer (2005)

(barriers and deterrents to organic conversion); Sierra, Klonsky, Strohlic, and Brodt (2008) (barriers to adoption of organic agriculture); and Lopez and Requena, 2005 (factors of adoption).

On the methodological front, the diffusion studies mainly focus on econometric models, Probit and Logit models being most suitable to investigate the effects of explanatory variables on dichotomous dependent variables (Feder, Just, & Zilberman, 1985). These models are actually largely applied in most adoption studies with many variants. These models typically emphasize farm and farmer characteristics rather than the characteristics of the technologies themselves. In addition to this, the characteristics-based techniques describe adoption as a function of the traits of the innovation (Useche, Barham, & Foltj, 2005). Davis, Bagozzi, and Warshaw (1989) emphasize consumers' psychological factors such as "perceived usefulness" and "perceived ease of use." On the other hand, the anthropologists and sociologists argued through qualitative methods to describe adoption behaviour (Nowak, 1992). As a matter of fact, modelling techniques have scarcely used qualitative methods, although many of the micro-level factors may not be tapped by conventional way of exploration employed in social research. This is more so for the newer innovations related to organic agriculture.

But who will undertake this important task? Does Extension have enough time and expertise to do so? Can Extension staff at least complement the efforts of social researchers who aspire to develop these models? According to the National Policy Statement on Staff Training and Development (1968), Extension system is expected to have multiple competencies, "research" being one of them. It is also reported that "synthesis of research" is considered one of the important roles that the Extension specialists are expected to perform (Woeste & Stephens, 1996, cited by Radhakrishna, 2001). Interestingly, Stephenson (2003) observes that the social science portion of Extension has been eliminated in recent times. The dichotomy and rift between these two groups have also curbed the possibility of collaborative work.

Now, as more Extension staff are working with the people than social researchers, they can take up the task of exploring micro-level factors that may be forwarded to social researchers for developing efficient models. Participatory tools have been used widely to understand micro-level realities of farmers (Mukherjee, 1993), and their participation in research may result in better understanding of innovations and their increased adoption (Lanyon, 1994, cited by King & Rollins, 1999). Hence, some novel participatory tools may prove helpful—to understand the adoption behaviour of farmers regarding organic agriculture, to promote organic agriculture at the community level, and to work in collaboration with social researchers effectively.

Objective of the Study

The objective of the study was to illustrate the exploration of identifying factors that may be used for developing adoption model for organic agriculture. This was done by studying - (i) farmers' perceived attributes regarding organic agriculture, and (ii) farm and farmer characteristics.

Methodology

Three villages of Baruipur Block of North 24-Parganas District, India, where a considerable number of farmers were practising organic agriculture for last 5 years, were purposively selected for the study. The farmers were identified through snowball sampling with the help of local agents of agricultural development. In snowball sampling, existing study subjects identify future subjects from/among their acquaintances. Thus the sample appears to grow like a snowball (Goodman, 1961). Here, the farmers themselves identified fellow farmers practising organic agriculture for some time. Identified farmers were then invited to take part in focus group discussion (FGD) and participatory diagramming exercise.

Perception of farmers regarding organic agriculture was identified through FGD and recorded on a flipchart, followed by their participatory ranking (Mukherjee, 2004). Modified Participatory Innovation Tree exercise (Van Mele & Zakaria, 2002) was used for studying the adoption and diffusion of the organic agriculture among the practising farmers. The sampled farmers were provided with cards and asked to place them on the floor according to the date at which they started practicing organic agriculture. At completion, innovators were at one end, while late adopters were at the other. The person or household who first started to go organic was then asked to explain who or what inspired him to do this. Then, in chronological order, all other farmers were asked to draw one or several lines to those cards that inspired them to become organic. The facilitator tried to find out what exactly convinced them to do it and what other than personal factors was involved in the decision-making process.

Results and Discussion

Farmers' perceived attributes regarding organic agriculture generated several factors that they considered critical during the adoption decision process (Table 1). The farmers themselves ranked these factors in terms of their importance. "Cost of production" and "productivity" were considered to be highly important factors by the farmers. The least important factors were "prestige among fellow farmers" and "satisfaction."

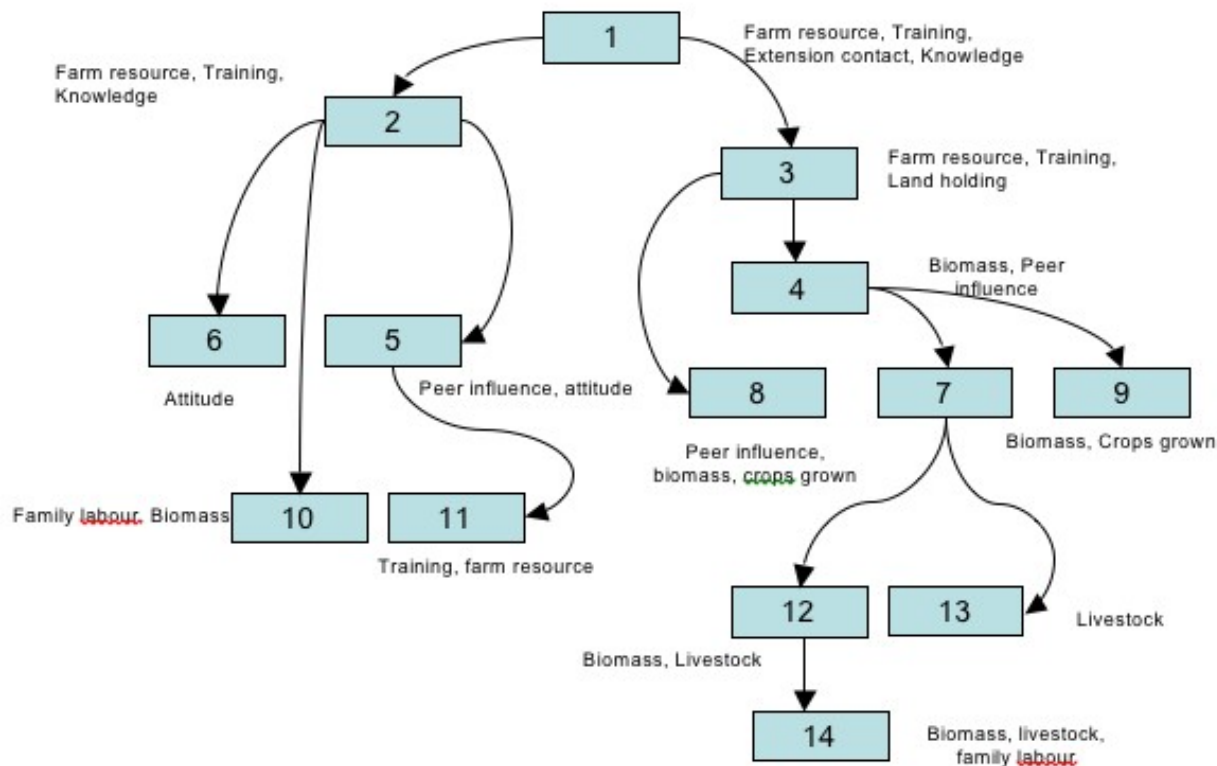
Table 1.

Perceived Attributes of Organic Agriculture and Their Ranking on the Basis of Relative Importance Assigned by Farmers

1. (Less) cost of production	I
2. (Improved) quality of farm produce	IV
3. (Reduced) pest infestation	V
4. (Low) productivity	I
5. (Availability of) organic source	III
6. (Bad) odor	V
7. (Improved) soil fertility	II
8. (More) time for farm inspection	VI
9. (Reduced) labor cost	VII
10. (Higher) Prestige among fellow farmers	IV
11. (Increased) Satisfaction	IX
12. (Higher) extension contact	X
13. (Low) access to inputs	II

From Figure 1, the identified factors during the innovation tree exercise can be seen. The boxes denote individual farmers who adopted organic agriculture. The lines connecting boxes indicate the flow of organic agriculture from one farmer to another. The factors influencing such flow are given beside the boxes. A variety of micro-level factors were identified from the exercise, like - "availability of biomass," "livestock ownership," "availability of family labour," "primary occupation," "complexity of farm level preparation of organic inputs," "farm resource," "holding size," "quality of farm produce," "training received," "information received," "Extension contact," "peer influence," "main crop grown in the farm" and "attitude towards organic practice." These are potential determinants that may be considered by the social scientists for inclusion in the model after empirical filtering like checking the individual contribution of these factors in an econometric model.

Figure 1.
Factors Responsible for the Adoption-Diffusion of Organic Agriculture as Identified Through a Participatory Innovation Tree Exercise



Conclusion and Implications

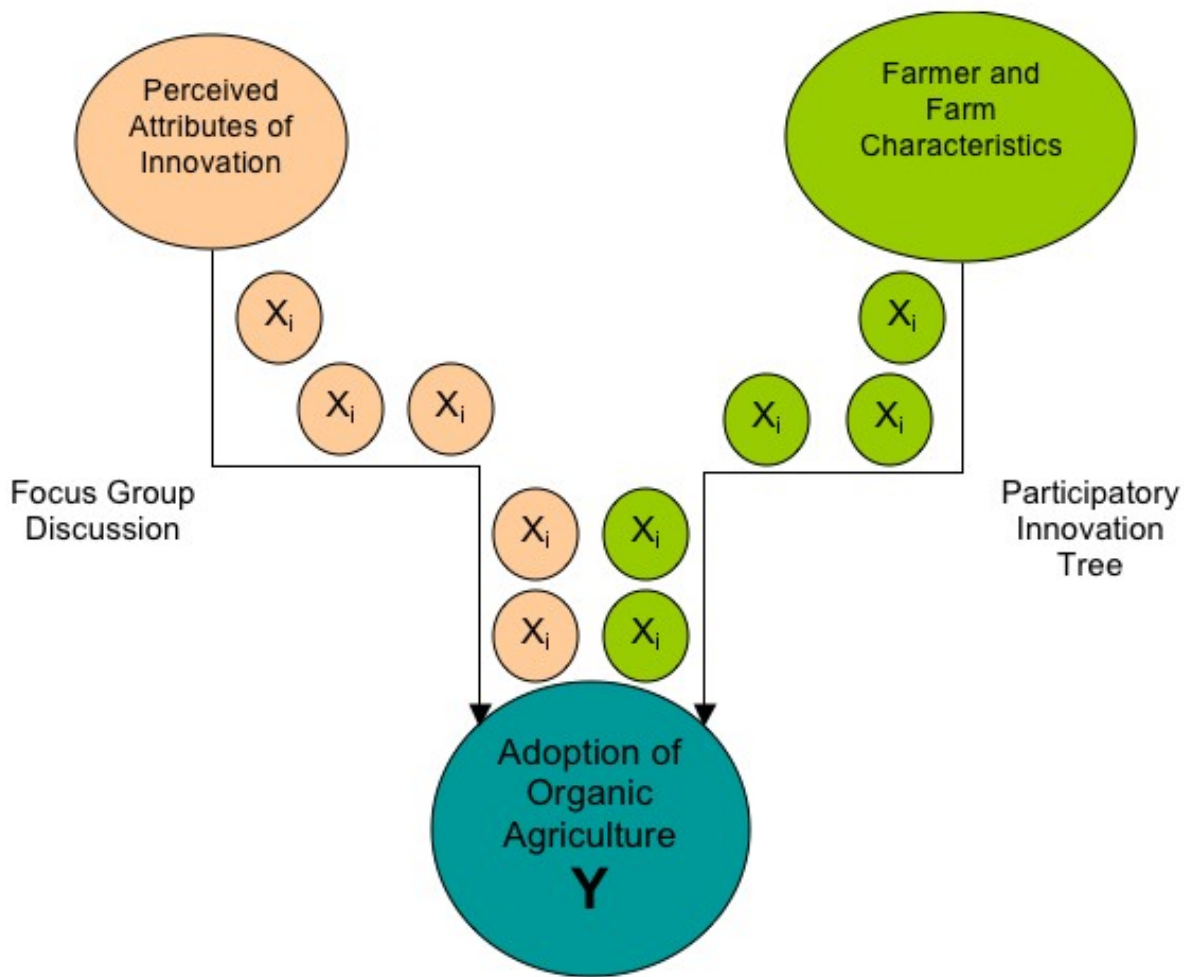
The above-described exercises scouted 25 factors that could influence the adoption decision of farmers regarding adoption of organic agriculture. Among these, 13 were identified through FGD on perceived attributes of organic agriculture (Table 1), and 14 were identified through a participatory innovation tree exercise (Figure 1). As three of the identified factors were common, a total of 25 factors could be identified. And this required only 6-7 hours of time in a field situation.

This article illustrates the process of using qualitative approaches that can complement the development of an adoption model for organic agriculture. The process may be observed in Figure 2. While the two larger circles denote different sources of factors, the smaller circles represent individual factors that will be considered for model development. The steps to be followed for this are: (i) identification of farmers through snowball sampling; (ii) study of farmers' perception regarding organic agriculture through FGD; (iii) identification of farm and farmer characteristics through participatory innovation tree exercise; (iv) forwarding unique identified factors to the researchers trying to develop adoption model; and (v) incorporation of such factors from several such multi-location studies.

Factors associated with the household level of farmers may be used as explanatory variables in the model, while the structural factors may be considered as sampling factor and/or controlling factor in a large-scale study.

Extension staff may achieve two benefits from such exercises. First, they can quickly understand the micro-level factors affecting the adoption of organic agriculture. This will help them to undertake effective Extension strategies at the micro level. Second, they can communicate these identified factors to the social researchers who are aspiring to develop adoption models for organic agriculture. Alternatively, Extension staff themselves may conduct survey work before promoting organic innovations or any other innovations that is environmentally sustainable. Third, as participatory exercises will be employed, Extension staff may expect higher client participation in their programs. Finally, this will facilitate the path of collaboration between Extension professionals and social scientists, a historical association unfortunately neglected in recent times.

Figure 2.
An Outline of the Process of Developing an Adoption Model for Organic Agriculture



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