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The Innovation Tree: a new PRA tool to reveal the innovation adoption and diffusion process

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Summary

A new Participatory Rural Appraisal (PRA) tool called the Innovation Tree has been developed. It has helped people to visualise and analyse the way in which an innovation is spread over time between community members. We found it to be a very useful tool, both to distinguish between innovators, and early and late adopters, but also as a way of helping both outsiders and the community to understand some of the social and psychological dimensions that influence the adoption and diffusion of an innovation within that community. The Innovation Tree also enables you to investigate how different personalities or types of innovators play a different role in promoting the technology to their colleagues, which is of direct relevance for developing farmer-to-farmer extension activities. The 'type one' innovator can inspire a wide range of people from different levels within a community and has a modest, mild, and inquiring character. Type one innovators can easily engage in farmer-to-farmer knowledge strengthening, both within and outside the community. The 'type two' innovator enthuses fewer and mainly like-minded people within the community, and has a strongly competitive character. These innovators are more eager to go outside the community to promote the technology, rather than getting engaged in educational activities.

Introduction

The Seed Health Improvement sub-Project (SHIP), which operates under the Poverty Elimination Through Rice Research Assistance (PETRRA) project in Bangladesh, started in 1999 and has mainly focused on seed cleaning, proper drying, and proper storing as three pillars to improve rice seed and seedling health. Activities have been undertaken in four villages in each of the seven agroecological zones. As SHIP began its fourth year, increased emphasis was put on how to improve scaling-up strategies. CABI Bioscience, as one of project partners, alongside the International Rice Research Institute (IRRI), has been at the forefront of developing, validating, and disseminating innovative discovery learning tools and approaches to increase farmer participation in crop and pest management.

During a national workshop in April 2002, potential uptake pathways were explored from the point of view of the national project partner organisations. These included the Bangladesh Rice Research Institute (BRRI), the Rural Development Academy (RDA) at Bogra, and four different non-governmental organisations: CARE, PROSHIKA, BRAC, and GKF. Farmer-to-farmer extension and the use of local leaders and institutions were mentioned as important uptake pathways, yet with no clear understanding as to how to proceed, and without information on the point of view of the end-

Photo 1. Participants from Maria village line up in two rows, one for the light and one for the heavy tables

Photo 2. After having placed their cards in chronological order of adopting the innovation, one by one they explain who or what inspired them to do this

users. The following illustrates how the community in Maria village, Bogra, expressed their point of view and expertise, after using the new PRA tool to analyse their own innovation adoption and diffusion process. Adoption is considered as the individual dimension of the process: individual households will refuse or adopt an innovation for various reasons, while diffusion is the next step explaining how and why (or why not) the adoption spreads between individual households.

Stimulating innovation

In Maria village, the key site for SHIP activities implemented by RDA, multipurpose seed drying tables were developed in a participatory way by stimulating people's creativity. People in Bangladesh traditionally dry their rice seed on the floor or on bamboo mats, also called *chatai*. The introduction of tube wells and new rice varieties over the past ten or so years enabled a lot of farmers to grow a second rice crop during the dry season. However, properly drying this *boro* seed has become one of the major bottlenecks, because it is harvested at the onset of the rainy season.

As post-harvest activities are mainly the responsibility of women, we organised a learning session with mainly the women of the 30 participating households. To ensure full ownership, the concept of improved drying was introduced through a visualisation and reflection session on physical processes such as ventilation and evaporation, rather than by

showing a ready-made drying table and trying to get people to adapt it to their own needs and means. A limited number of questions, embedded in real-world situations, were developed to stimulate the thinking process, and by the end of this two-hour session, all agreed upon useful criteria for making seed drying platforms or tables.

In a next session these criteria were further discussed with both husbands and wives, and the participants developed a monitoring sheet. We transferred this to an A4 sheet. All households received a copy and were asked to record the date at which they would make their table. It was made clear from the early onset that if they wished to make one, it would be at their own expense.

Within a period of only five months all the 30 households engaged in the project had adopted the idea of this technology, each bringing in their own innovations. More than 60% of the multipurpose drying tables were designed and made after close consultation between husband and wife. Personal observations and informal talks also revealed an important exchange of ideas between households. We wished to know how could we find out how people within the community inspired one another, and what could we actually learn from this?

Why analyse the innovation diffusion process?

We believe that visualising the innovation diffusion process could help:

Photo 3. Hamida indicates who inspired her to adopt the innovation

Photo 4. Zabed Ali indicates who inspired him

- provoke community reflection and raise awareness about the dynamics of the process;
- provide insights into the social and psychological dimensions underlying the innovation diffusion process; and,
- identify which people, or more specifically, which personalities, to engage in a particular farmer-to-farmer extension activity.

A better understanding of the innovation diffusion process could help outsiders to better target their community innovation activities. Secondly, it is generally agreed upon that, for the selection of extension workers, not only the technical but also the facilitation skills are important criteria. This is equally important when selecting farmer facilitators, and as such we have looked for a way to gather insights in the underlying social and psychological dimensions of the innovation adoption and diffusion process. As far as we were aware, no PRA tool existed to visualise such a process and encompass some of these factors.

Flexibility and creativity are key factors in participatory approaches. Through brainstorming we ended up with the Innovation Tree, in which ideas from a flow chart and a method to identify indigenous specialists have been adjusted and combined.

Materials
Each household needs a card about half an A4-size, and there should be enough markers. The session is best held in an open space in the village, but could also been done indoors presuming a large enough floor or wall can be found. Lines can be drawn with either a stick in the sand, or with crayons on harder surfaces.

How it works
- Invite those households who have adopted or adapted a technology for a meeting, brief them about the objective of the exercise, and provide cards and markers.
- Ask them to write their name on the card, along with the date on which they adopted the technology. The fact that they have recorded this date on their monitoring sheet may help at this point. If the illiteracy rate is high, pictures of the participating households can be used instead of written names.
- Explore with the participants whether the technology could be classified into broad groups. In our case, for instance, the participants clearly distinguished two broad classes of drying tables, namely light ones and heavy ones.
- Draw one line for each group, leaving ample space between each line. The length of the lines depends on the number of participants, and whether you do it indoors or outdoors. In the open you should allow for at least half a metre per household.
- Ask the participants to bring their cards and place them on the line according to which broad group they belong to (photo 1).
- Ask them to re-arrange themselves according to the date at which they have adopted the innovation. At completion, innovators should be at one end, while late adopters should be at the other. After having laid their card on the line, they can go back to the group.
- The person or household who first made the innovation is asked to take the floor and explain who or what inspired them to do this (photo 2). One facilitator guides the process, while another records all the comments.
- Consequently, and in chronological order, all the others are asked to draw one or several lines to cards of households who inspired them to also adopt the idea of the innovation, while adapting it to their personal needs and limitations. Lines can be drawn within or between groups

Table 1. Some social and psychological characteristics influencing the innovation adoption process. Factors identified in our project by applying the Innovation Tree are indicated by an *

Social factors		Psychological factors	
Stimulating adoption	Inhibiting adoption	Stimulating adoption	Inhibiting adoption
Personal communication network*	Opposition in the farming community	Innovation proneness*	Complexity of technology
Social participation*	Social isolation	Risk taking ability	Risk avoidance
External pressure*[1]	Poverty	Extrovert*	High level of stress
Common need for solving a problem		Overall knowledge	Lack of knowledge about the technology
		Self fulfilment*	Lack of motivation
		Pride in ownership*	Mistrust of project staff
		Level of aspiration	

(photos 3 and 4). The facilitator tries to find out what exactly convinced them to do it, and what other than personal factors were involved in the decision-making process. Although subtlety is the master of the facilitator, the underlying question is 'Why was household x a source of inspiration and not household y, while both adopted the innovation before you did?'. Preferably a third facilitator simultaneously copies the name cards and lines on a sheet for later processing (figure 1).

- The last part of the exercise is the most important one, as this is the time to facilitate group discussion and stimulate reflection. The first step in the discussion should deal with the innovation process itself, and depending on the objective, focus more on either the technical, economic, social, or psychological dimensions.
- During the last part of the discussion the facilitator tries to draw on the insights gained from the exercise, and explores who could contribute in which way to scaling-up the innovation diffusion process.

Revealing social and psychological factors

Farmer decision-making in adopting a technology is influenced by institutional, economic, cultural, social, and psychological characteristics. A whole range of anthropological and social tools exists to reveal mainly the first three categories. The social and psychological factors enhancing or inhibiting the actual adoption can be analysed directly with the community through the Innovation Tree. As these factors are often location- and technology-specific, a list of factors is given in Table 1 based on a literature review and personal experience.

The above factors partly determine whether a technology is adopted or not, but the Innovation Tree exercise has also enabled us to investigate how different personalities or types of innovators play a different role in promoting the

[1] The presence of the project and visits of international staff contributed to certain people being eager to make a good impression.

Table 2: Profiles of two types of innovators as identified in the Seed Health Improvement sub-Project, Bangladesh

	Type 1 Innovator	Type 2 Innovator
Main interest	Knowledge	Technology
Personality	Modest, mild, and inquiring	Competitive
Social interaction	Intense	Limited to like-minded people
Potential contribution to extension	Action learning	Technology promotion

Figure 1: Example of the Innovation Tree transferred to paper. Note that participants decided to distinguish between two broad groups of innovations in this case: light and heavy multipurpose drying tables
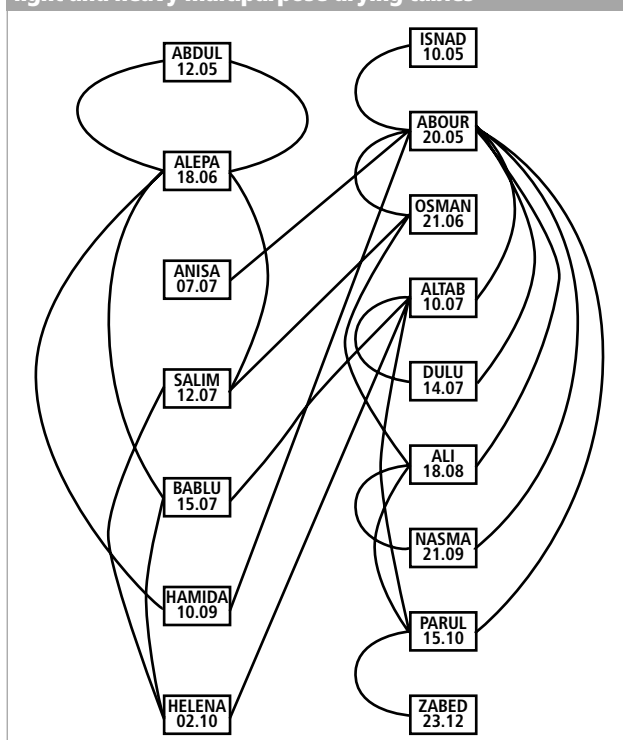
technology to their colleagues. We have identified two types of innovators (Table 2).

The first type of innovator has inspired a wide range of people from different levels within a community and has a modest, mild, and inquiring character. This innovator has enthusiastically engaged in farmer-to-farmer knowledge strengthening of seed health management, both within and outside the community. The second type has enthused fewer and mainly like-minded people within the community, and has a strongly competitive character. This innovator has been more eager to go outside the community to promote the technology based on his innovation, rather than getting engaged in education activities.

Conclusions

Although the Innovation Tree has so far only been used on a small-scale in a few villages and with a focus on a technological innovation, it can be applied with any type of innovation, whether triggered by a project, a workshop, or any other communication channel.

As illustrated above, we believe the Innovation Tree is a useful tool to distinguish between different types of innovators, but also to better understand the psychological and social dimensions underpinning the decision-making process, which would be difficult to disclose in other ways. This may yield valuable information about which people or, more

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broadly, personalities (and even institutions) to engage in a particular scaling-up activity.

However, as with any PRA tool, none can stand 'on its own' and therefore we stress the need to complement this tool with other PRA tools or techniques such as semi-structured interviews and personal observations. The tool may need to be modified to take account of the different adaptations made to the innovation by the different participants.

And last but not least, it is important to realise that the output from the discussion following this PRA exercise goes much further than the actual innovation, adoption and diffusion process. Indeed, as is often the case, discussion topics quickly evolve towards social development issues and how community members see their role in this process.

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