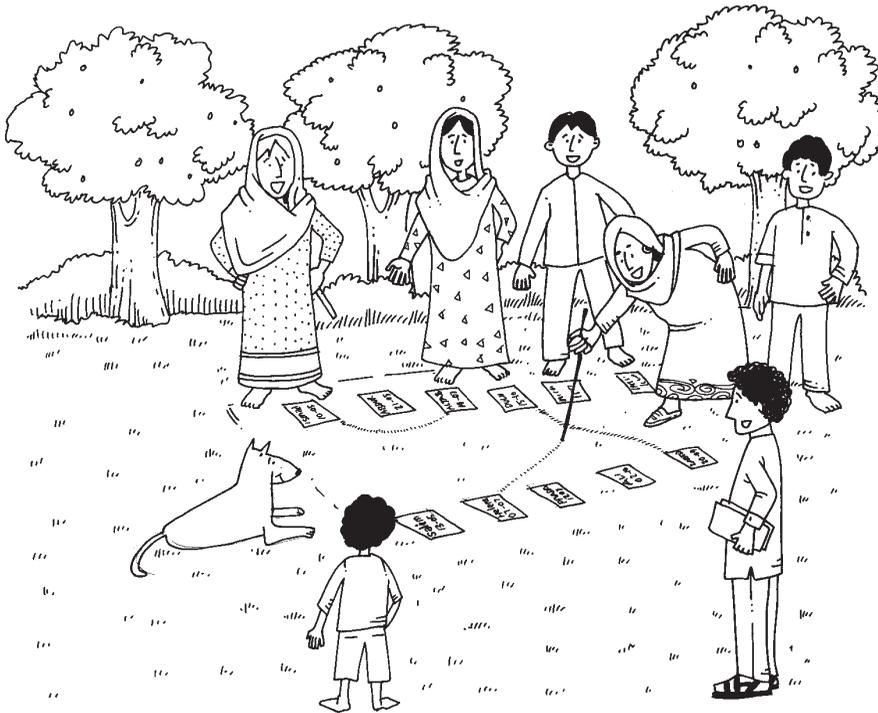# The Innovation Tree: Visualizing Dynamics in the Community Innovation System

An Innovation Tree is a new tool that helps people to visualize and analyze the way in which an innovation is spread over time among community members. It is a useful tool to distinguish between innovators, early and late adopters, and to help 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 allows for investigating 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.

This paper illustrates how the community in Maria village, Bogra, Bangladesh expressed their points of view and expertise, after being triggered by the Innovation Tree to analyze their own innovation adoption and diffusion process. Adoption is considered as the individual dimension of the process: individual households 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.

This discusses the experience of the Seed Health Improvement Sub-Project (SHIP) under the Poverty Elimination Through Rice Research Assistance (PETRRA) project in Bangladesh, managed by the International Rice Research Institute (IRRI).

SHIP started in 1999 and has mainly focused on improving the quality of farmer-saved seeds. As the project began its fourth year, increased emphasis was put on how to improve scaling-up strategies. 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-users.

CABI Bioscience trained local partners in innovative extension approaches. The new participatory rural appraisal (PRA) tool presented here is an output of this mutual learning process.

Stimulating Innovation

People in Bangladesh traditionally dry their rice seed on the floor or on a bamboo mat, also called *chatai*. The introduction of irrigation pumps and new rice varieties over the past 10 years or so enabled a lot of farmers to grow a second rice crop during the dry season. However, properly drying *boro* seed has become one of the major bottlenecks, because it is harvested at the onset of the rainy season. In Maria village, multipurpose seed drying tables were developed in a participatory way by stimulating people's creativity.

As postharvest activities are mainly the responsibility of women, a learning session with them (from 30 participating households) was organized. To ensure full ownership, the concept of improved drying was introduced, through a visualization and reflection session on underlying principles such as ventilation and evaporation. A few questions, embedded in real-world situations, were developed to stimulate the thinking process, and by the end of the 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 and 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 at the onset that if they wished to make one, it would be at their own expense.

Within a period of only five months, all 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. How people within the community inspired one another, and what could be actually learned from this were likewise accounted.

Analyzing the Innovation Diffusion Process

Visualizing the innovation diffusion process could help in:

❑ provoking community reflection and raising awareness about the dynamics of the process
❑ providing insights in the social and psychological dimensions underlying the innovation adoption and diffusion process
❑ probing which people, or more specifically personalities, to engage in a particular farmer-to-farmer extension activity

A better understanding of the innovation diffusion process could help outsiders in better targeting their community-innovation activities. In 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, a way to gather insights in the underlying social and psychological dimensions of the dynamics of the community innovation system was looked into. No PRA tool existed to visualize such a process and encompass some of these factors.

The Innovation Tree: How it Works

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 be done indoors presuming availability of a large floor or wall. Lines can be drawn with either a stick in the sand, or with crayons on harder surfaces.

The Innovation Tree can be done using the following steps:

1. 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.

2. Ask them to write their name on the card along with the date on which they adopted the technology. The fact that they themselves have recorded this date on their monitoring sheet may help at this point. In case the illiteracy rate is high, pictures of the participating households can be used instead of written names.

3. Explore with the participants whether the technology could be classified into broad groups. For instance, the participants clearly distinguished two broad classes of drying tables, namely, light ones and heavy ones.

4. 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 space, allow for at least half a meter per household.
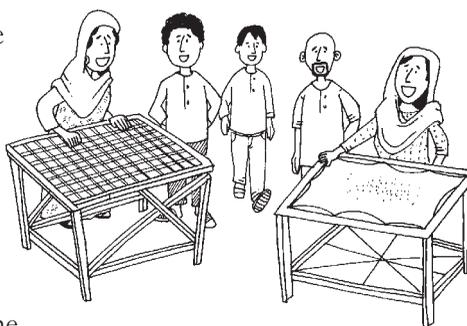
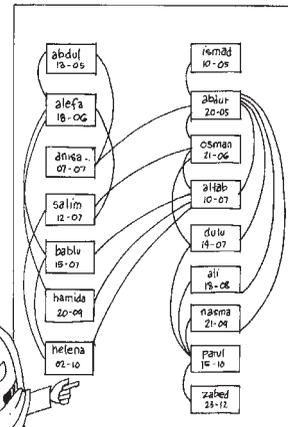5. Ask the participants to place their cards on the line according to which broad group they belong to.

6. 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 at the other. After having laid their card on the line, they can go back to the group.
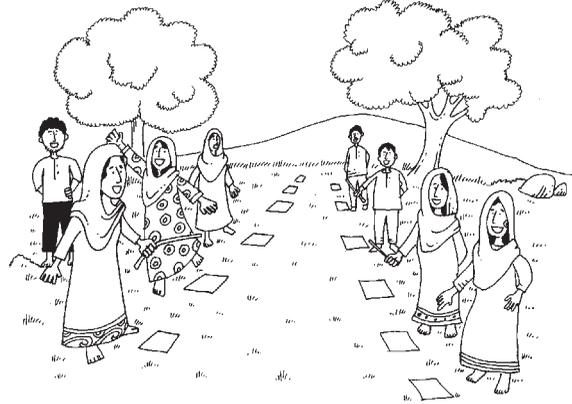
7. Ask the person or household who first made the innovation to take the floor and explain who or what inspired them to do this. One facilitator guides the process, while another records all the comments.

8. Consequently, in chronological order, ask all the others 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. 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.

An example of an Innovation Tree

9. 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. Depending on the objective, focus more on either the technical, economic, social, or psychological dynamics of the innovation system.

10. 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 science tools exists to reveal mainly the first three categories. The social and psychological factors enhancing or inhibiting the actual adoption can be analyzed directly with the community through the Innovation Tree. As these factors are often location- and technology-specific, a list of factors is given based on a literature review and personal experience (Table 1).

Table 1. Some Social and Psychological Characteristics Influencing the Innovation Adoption Process

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	Extravert*	High level of stress
Common need for solving a problem*		Overall knowledge	Lack of knowledge on the technology
		Self fulfillment*	Lack of motivation
		Pride in ownership*	Mistrust of project staff
		Level of aspiration	

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

*   Factors identified in the project by applying the Innovation Tree.

The above factors partly determine whether a technology is adopted or not, but the Innovation Tree exercise also enables the researcher to investigate how different personalities or types of innovators play a different role in promoting the technology to their colleagues.

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 drying table that shows his own ingenuity, rather than getting engaged in farmer education activities (Table 2).

Table 2. Profile of the Two Types of Innovators

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

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, 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 personalities (and even institutes) will engage in a particular scaling-up activity.

However, as with any PRA tool, none can stand on its own and therefore the need to complement this tool with other 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.

It is important to realize 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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Participatory Research and Development for Sustainable Agriculture and Natural Resource Management: A Sourcebook