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Farmers as Partners in Knowledge Development

It is fashionable to talk about "partnerships" and "stakeholders." Unfortunately, the main stakeholder—the farmers—are often overlooked in the process of search for and development of knowledge despite their extremely rich knowledge.

Knowledge can be classified into (i) *explicit*, which can be easily recorded (e.g., books) and (ii) *tacit*, which cannot be always articulated. However, much of this "tacit" knowledge can be shared. The conversion of tacit knowledge into explicit knowledge is called "externalization." Farmers possess both kinds of knowledge. Scientists often pre-determine ignorance largely because they have little interest in externalizing farmers' tacit knowledge. A new form of knowledge is generated by combining (analyzing, categorizing, and integrating) this externalized explicit knowledge of several individuals/entities so as to create a "new explicit" from tacit knowledge.

Stakeholders in agricultural knowledge development and consequences for partnership

The various stakeholders involved in development and the adoption of agricultural technology/knowledge should ideally focus their work on improving the lot of all partners, of whom the poor—most of them small rural/farm-households—though an overwhelming majority, wield hardly any power. The premise of this article is that "partnership" and "participatory concepts" have been rather insufficiently practiced by some stakeholders—e.g., scientists and development managers—to the detriment of the ultimate stakeholders, the farmers, especially the small farmers/farm-households.[1] Stakeholders have significant differences in their objectives, concerns, resources, and levels of control and power, which render the partnership shaky at best and infeasible at worst. For example, the objectives of scien-

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tists are generally to produce "new" technologies which are high yielding (often for the person concerned), bringing benefits to them in terms of publications, recognition, scientific progress, etc. For several institutions (especially international agricultural research institutions), this has been a deliberate strategy, in line with their mandate to develop such technologies. Their scientists usually develop these technologies on research stations, where conditions of management, input supply, and risk are quite different from those on farmer's fields, though testing these technologies on demonstration and innovator's farms helps in partially narrowing these differences. Their task is made more difficult by factors such as: (a) their partial perspective (of looking at a single commodity or even a farming system, but often ignoring the farm-household system which is central to the overall decision-making process of the farm family); and (b) the wide variety of natural, social, cultural, and economic constraints under which the farmers operate.

The concerned researchers, educators and project managers are likely to be experts on their own subjects, and hence tend to view the farmer as an ignorant stakeholder, who can only learn (and by implication, benefit) from them. They consequently perceive the process of knowledge development and transfer as a one-way channel. Their stakes in case of the failure of a new technology are relatively small; for the poor small farmer, it is a matter of survival. Further, the scientists and development managers are usually oblivious or indifferent to the local value system and ethos. Therefore, their approach (diagnosis of problem, setting objectives and pace of technology development and adoption) suffers from what is termed as the "external expert stance." Rather than being partners, they often act as players belonging to different teams. The problem is exacerbated by differences within the farming communities. For example, small farm-households are not a uniform entity but extremely heterogeneous in terms of their (a) objectives; (b) resource endowment; (c) family size and composition; (d) formal and informal education; and the (e) natural, social, ethnic and policy environment. The indigenous knowledge that they have developed and acquired through generations is therefore highly diverse; it is conditioned by as well as tailored to the above factors. Within the above framework and their present level of knowledge/information, most farmers operate at optimal/ near optimal level in terms of their overall farm-household activities. Given their general levels of poverty and precarious economic situations, they try to follow a system which is conducive to sustainable livelihood and continuously adjust to changing circumstances. Thus their knowledge, while likely to be traditional, is by no means static.

Desirable features of a farm household-friendly technology

From the viewpoint of a farmer, a new technology can be said to be sustainable, if it passes the acid tests of : (a) technical feasibility within the current/ potential absorptive capacity of the farmer; (b) being relatively less risk-prone; (c) economical profitability; (d) social acceptability; and (e) environmentally friendly. Some technologies are examined in the attached table in terms of some of these characteristics under the assumptions of their already being technically feasible. An ideal technology for farmers would naturally be the one which, from their standpoint, combines all these virtues to the extent possible. The weight given by farmers to these characteristics would vary according to their resource endowment, social condition, family priorities, etc. Hence, there is no single technology which would be perfectly suitable and acceptable to every farmer even within a region or a locality. However, it can be safely concluded that nearly ideal "new" technologies are likely to be those which are a refinement of the technologies already being followed by or familiar to the farm-household and for which additional preconditions of adoption (input supply, marketing, etc.) are assured. Development of such technologies requires learning from farmers, analyzing the reasons for their present practices, building upon their indigenous knowledge, finding their constraints, cooperating with them, fostering their innovative potential and carefully assessing their absorptive capacity.

A few examples from India demonstrate why introduced, inappropriate technologies are not accepted by the farmers.

Examples of some experiences

High- yielding varieties of maize and wheat

India introduced high-yielding hybrid varieties (HYV) of maize in the late 1960s. To realize their full potential, these needed highly-controlled water management and a relatively high dosage of fertilizer. The farmers had to purchase new seed every year. The cobs of the new varieties were too big for roasting and also less tasty. Some types of composite varieties, developed as a consequence of this experience, though not so high-yielding, overcame some of the problems.

The first HYVs of wheat, introduced at around the same time in India, were relatively easier to cultivate. They did not require purchase of seed every year, but were susceptible to water-logging. Their color was reddish, different from the preferred amber color of the local varieties. Awnless high-yielding varieties of wheat had high grain production, but practically no straw. These might have been fine for the highly mechanized farms in developed countries, where straw has little use. But for the Indian farmer, straw is very valuable as animal feed, thatching material, and fuel. Consequently, Indian scientists bred amber-colored dwarf varieties.

Diverse experiences with two rice varieties

Scientists in India heavily favored and promoted IR8, amongst the first HYV of rice developed by the International Rice Research Institute in the Philippines. It had a coarse grain but was easily susceptible to pests and diseases. The adoption of this variety by farmers was gradual. The story of another variety, Mahsuri, is different. It shows that, if the new technology meets farmers' needs, they would adopt it even when it has not found favor with the scientists. "The most striking example is the paddy variety of Mahsuri which was introduced in India from Malaysia for tests during 1967–68. After two years of work, this variety was rejected by rice breeders on account of its lodging behavior. But somehow the seed reached some villages through a farm laborer in Andhra Pradesh. Farmers who tried it found its performance excellent. As a result, it spread from Andhra to Orissa, and then to West Bengal, Bihar, Uttar Pradesh and part of Madhya Pradesh. As a result of this farmer-to-farmer extension, Mahsuri is now the third most popular variety among Indian farmers, after IR8 and Jaya dwarf rice. Its semi-tall habit, high tillering, heavy panicle, high milling out-turn and excellent grain quality make it well-liked by farmers. (Maurya, D.M. "The innovative approach of Indian farmers" in Chambers, R. et al**.** *Farmer First*, London, Intermediate Technology Publications, 1989)

Introduction of the Jersey breed in Himachal Pradesh

Smallholder farmers in the state of Himachal Pradesh practice mixed crop and dairy farming and usually maintain a pair of draft oxen. In order to improve their income and nutritional status, a development project introduced pure Jersey breed cows. These are high milk yielders, require good management, and have no hump. However, in spite of its high milk yields and subsidies on purchase and feed, this breed did not find favor with the farmers. Its male progeny, in the absence of a hump, could not be used for draft purposes (ploughing, threshing, transportation, etc.). The scientists took a clue from the farmers' attitude and experimented with a cross between the Jersey and the local breed. This cross-breed, in spite of its lower milk yield as compared to the pure Jersey, found a wider acceptance among farmers, because it had a hump and served both as a milk and draft animal.

Some lessons

Farmers cannot be expected to blindly adopt technologies developed and propagated by stake holders whose objectives, interests, and constraints are often substantially different from their own. If the scientists, development planners and managers, wish to develop some "new" knowledge for the farmers/farm-households, they would need to first look at what the farmers are doing, how they are doing it, and understand the reasons for the same—any related proposal would need to make sense in this context. Farmers need more meaningful options and not prescriptions. Such options can be best developed with their participation and through knowledge sharing as real partners, ready to share both the profits and risks.

1 Though farm activities are a subset of farm household activities, the two terms have been used interchangeably in this article.

Characteristics of cropping/farming systems under various stages of technological development

	System	Productivity§ (per unit of land)	Stability (vis-à-vis risk)	Sustainability*	Equitability/ Social Acceptability
1	**Shifting Cultivation**	Low	Variable (usually less risky)	High	High
2	**Traditional lowland rice-based cropping system**	Medium	Medium	High	Medium
3	**First generation improved rice varieties introduced in system 2**	High	Low	Low	Low
4	**Modern improved rice varieties introduced in system 2**	High	Low to Medium**	Medium	Medium
5	**Genetically engineered varieties**	High	Low***	Variable (low in terms of adoption)	Low
6	**Ideal cropping System**	High	High	High	High
7	**Ideal small farm-household system**	High (a level consistent with optimal use of overall household resources and not simply per unit of land)	High (at least ensuring subsistence level)	High in terms of adoption; Medium in terms of time horizon	Medium to High in view of diverse cultural background

§ High productivity is not synonymous to high profitability.
* Sustainability has several dimensions. Here, it has been used from the viewpoint of environment and adoption.
** Because of increased dependence on external factors (input supply, marketing, etc.).
*** Many require special inputs.
Source: Significantly adapted from Beets W. C. *Raising and Sustaining Productivity of Smallholder Farming Systems in the Tropics*. Alkamaar,1990.

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