

# Importance of Methodological Diversity in Research and Development Innovation Systems



Innovations in research and development (R&D) take place in diverse and complex human and natural landscapes that thrive within specific political, economic and institutional contexts. An innovation, as described in this paper, is neither a research product nor a technology, but rather an application of knowledge to achieve desired social, ecological or economic outcomes. This knowledge might be acquired through learning, research or experience, and may come from a variety of sources and actors, but until applied it can not be considered an innovation (Hall *et al.*, 2004).

Human landscapes and innovation systems are also dynamic in nature. This is especially true of today's globalized world, with its mobile populations, decentralizing governments and rapidly changing roles and rights. This dynamism manifests as a constantly changing mix of risks, opportunities and livelihood strategies (McDougall and Braun, 2003).

The challenges of this diversity, complexity and dynamism call for a corresponding diversity of R&D methods. The multi-faceted dimensions of communities and farmers' needs, and the multiple demands on their precious time influence the choice of methods for situation analysis, technology development and resource management, negotiation, communication and farmer education. A wide range of methods, and of actors implementing them, allows for greater responsiveness, flexibility and fine-tuning to the context and needs of specific client groups.

Diversity in R&D innovation systems can be assessed in terms of the:

- ❑ biophysical environment, including agricultural and natural resources
- ❑ political, economic and institutional contexts
- ❑ actors in the system, and their perspectives, ideas and opportunities
- ❑ research, extension and farmer education methods.

In this paper, we focus on the diversity of R&D methods, the actors, and their interface, by examining the implications of diversity at the level of individual R&D actors and at the level of national and global innovation systems.

## Learning About Diversity in Innovation Systems

### Multiple Versus Single Methods at the Level of R&D Actors

Individuals and organizations need to continuously assess their expertise and capacity to better position themselves as R&D actors. Some actors may specialize in methods or approaches such as participatory rural appraisals (PRA) or farmer field schools (FFS), while others position themselves more broadly as managers or facilitators of agricultural knowledge and information systems. Focusing on a single method, or skilfully deploying a few methods, allows actors to develop specific expertise, while at the same time further improving the method. Some pros and cons of focusing on a single method or approach are given in Table 1. Methodological diversity in the system allows R&D actors to tap into their own

**Table 1. Pros and Cons of Focusing on a Single Method from the Perspective of an R&D Actor**

Advantages	Disadvantages
Potential to develop expertise and take a strong position as an R&D actor	Personal interests in careers may hamper a true partnership environment. Actors may become blind to innovations coming from perceived 'competitors'
Efficient use can be made of human and financial capital	High pressure to promote a single method globally, whereas priority and goodwill of donors may change over time
Scope to learn and advance the method by applying it in different contexts	Actors may demonstrate a low flexibility to adjust method to local contexts

organizational strengths and explore what works best for them under which conditions. Diversity also enables them to play the card of complementarity. Partnerships built on the strengths of the individual actors pave the way for combining various methods available in the system. This moves away from the idea of a one-size-fits-all technology or an ideal blue-print methodology. We illustrate this with two examples, one from an organization that facilitates capacity building in national R&D systems, and another that works directly with rural communities.

Recently, the inter-governmental organization CABI *Bioscience*, with an expertise in farmer education methods for sustainable agriculture, collaborated with a UK-based private company, called Countrywise Communication, to develop competency in videos for training. Together with the Rural Development Academy and a Bangladeshi women's non-government organization (NGO), they produced videos on post-harvest that were more efficient in training rural women than face-to-face extension (Van Mele *et al.*, 2005). The partnership helped CABI to further advance its expertise in developing and implementing innovative farmer education methods.

#### **Example 1: Institutional Learning in Participatory R&D at CABI *Bioscience***

CAB International was established in the early 20<sup>th</sup> century to foster the international sharing of knowledge from agricultural science and to help tackle specific agricultural constraints. While the users of this information were originally the national agricultural research system (NARS), in recent years, greater emphasis has been placed on how this pool of knowledge can be more effectively accessed and used by communities themselves.

In the early 1990s, the formerly independent institutes of CABI *Bioscience*, the scientific division of CAB International, had little experience of participatory R&D though many years of working in developing countries and with tropical agriculture. A new role began to emerge as a provider of technical backstopping to the Food and Agriculture Organization (FAO) FFS programs in Asia. Over the years, CABI supported FFS across the globe, helped to expand the training curriculum from insect to disease management, and adapted the method for use in perennial crops such as cocoa, coffee and fruit. CABI's ecologists, taxonomists, biotechnologists and senior management all became familiar with the concept of FFS. New staff were hired with broader field experience, new types of partnerships emerged with commercial companies, and interest grew in developing a 'new' sustainable, organic, equitable and fair agriculture. More recently, collaboration with anthropologists and communication specialists from outside the organization has given rise to innovations such as community plant health clinics, "Going Public", and the use of videos in farmer education.

It is difficult to see how such innovations might have arisen in a research institute or university, where staff advancement depends on academic publications. CABI *Bioscience* has a more flexible approach, using the pro-active development of initiatives and project impacts to reward staff achievements. Operating as a learning organization and driven by demands from its member countries, CABI has been able to respond to emerging international needs through multiple innovations and as part of larger learning networks.

The second example illustrates how two farmer education methods, each pioneered by a different international organization, found fertile ground in one and the same national implementation agency. The Bolivian non-profit foundation, Fundacion Promocion e Investigacion de Productos Andinos (PROINPA), saw complementarity in local agricultural research committees (CIALs) and FFS and consciously decided to work with them in an integrated manner. Through several cycles of fieldwork, PROINPA learned how to coordinate the complementary use of these methods. Where simple knowledge is sufficient to address a specific problem, they use workshops and presentations at local markets. The latter is a new method called Going Public, developed with CABI *Bioscience* (Bentley *et al.*, 2003).

### Example 2: PROINPA's Decision Criteria for Applying Complementary Methods

Apply CIAs when....

- Farmers give high priority to solving specific problems or constraints in the production system
- There is strong leadership in the community or an interest group with the organizational capacity to form a CIAI
- A community has experience with participatory approaches and collective action (CIAIs are formed easily in communities that had FFS)
- There is some financial support and commitment to follow-up from seed money provided by R&D organization or from the local government

Apply FFS when...

- There is community interest in initiating collective action
- There is local demand for training on specific issues of recognized importance
- Appropriate technology and knowledge is available that can be incorporated in the training process
- There are sufficient financial and human resources to operate FFS

Oscar Barea (personal communication)

These examples illustrate the need for R&D organizations to become more familiar with existing methods, to assess their appropriateness, to build synergies with their own methodological expertise if possible, and to innovate when necessary.

## The Need for Diversity at the Level of R&D Innovation Systems

While focusing on one or a few methodologies may have advantages for an individual R&D actor, the propagation of a single method at the national or global level has some important drawbacks. Quality issues are likely to emerge when a single method is scaled up massively, as shown by the FFS experience. This, however, does not mean that farmer education with a strong emphasis on discovery learning has no global significance (Röling and Wagemakers, 1998).

Methods that are promoted globally may be perceived as imposed by those who implement them. They may be viewed as a damper on local methodological and institutional innovations. Just as the lack of local ownership of technologies may result in non-adoption, the same holds for methodologies and working philosophies, especially complex ones.

The promotion of a single blue-print approach or method is risky when it ignores the economic, political and institutional context in which actors operate. A well-known example is the Training and Visit (T&V) system of extension, previously promoted by the World Bank and part of the "Transfer-of-Technology" or "pipeline" model of innovation. This led to a wave of participatory approaches and a new cycle of learning from failures and successes. Recent critiques of participatory approaches (Gujit and Shah, 1998; Cooke and Kothari, 2001) further emphasized that development-oriented research processes need to be tailored to particular circumstances. Research has multiple dimensions and each includes a spectrum of possibilities. Conventional and participatory research are not independent or discrete activities. To ensure quality, researchers are encouraged to focus on skilfully combining elements from the different dimensions in order to tailor research to specific circumstances (McDougall and Braun, 2003).

# Promoting Diversity in Innovation Systems

## National Policy

Clearly, the strength of an innovation system depends on the strengths of its components and the management of its linkages. Developing a clear understanding of the historical, political and institutional dimensions of the system and its components is crucial to draft national policies that not only help to build capacity in individual R&D actors, but also to create incentives and support mechanisms for institutional learning and partnerships that will improve the system performance overall.

Policymakers may be put under pressure to promote a single method, at the expense of overall system adaptability and robustness. While developing national research and extension policies, decision-makers need to be aware of the human dimensions of R&D. The impetus for methodological monocultures is often associated with strong lobbyist groups and personalities. Decision-makers need to ensure that the promotion of a method builds on local social capital and on previous methodological experiences. This can be done by shaping an environment where creativity can flourish, and multiple methods and partnerships can be assessed objectively in response to new emerging needs.

As innovations come from multiple sources (Biggs, 1990), including the farmer community, the education system and the private sector, research and extension policies need to be better coordinated with rural development, education and trade policies, as these directly or indirectly shape the innovation system.

## Donor Policy

The new challenge for donors is to approach R&D from an innovation systems perspective, recognizing that multiple sources of innovation exist within economic, political and institutional contexts. Donors can facilitate the testing and fostering of partnerships between R&D and private businesses, or between R&D and the education system.

Identifying champions with expertise in one method may not be too difficult, while finding facilitating actors or setting up structures that can bring multiple sources of expertise together in an open learning environment is more challenging. Mapping out actors, assessing their organizational cultures, and creating early opportunities for them to interact, share experiences and build trust may be a first step in the right direction to boost methodological and institutional innovations (Van Mele *et al.*, 2005).

Creating an open learning culture requires commitment, flexibility and fundamental changes in norms and values, not only within implementing organizations, but equally within the donor community. Allowing for flexibility is letting go of control. Mechanisms need to be developed that allow actors in the R&D system to capitalize on the diversity of perspectives, ideas and opportunities that arise when implementing a project or program. An example of a successful approach that promoted methodological diversity was managed by the International Rice Research Institute (IRRI) from 1999-2004.

### Example 3: IRRI Promotes Methodological Diversity in Bangladesh

Funded by the UK Department for International Development (DFID), The Poverty Elimination Through Rice Research Assistance (PETRRA) project approved and supported 45 sub-projects between 1999 and 2004. These had a focus on pro-poor policy, technology development, or on uptake and extension.

Sub-projects were approved at different stages through a competitive bidding mechanism. More than 50 partner organizations, including NGOs, government organizations and private sector, worked in partnership, some in turn involving a broad range of local NGOs and community-based organizations. Many innovations emerged from building on the organizations' own strengths and enabling cross-fertilization between sub-projects. Innovations ranged from partnerships to develop a pro-poor market for mobile pumps, to pro-poor seed systems, to "picture-songs" that combine song and dance with large paintings of, for instance, rice insect pests and their natural enemies.

Flexibility and ownership were the keys to mainstreaming methods. Both at management and sub-project levels, PETRRA linked underlying values of the learning organization – empowerment of its members, rewards and structures fostering initiatives, and experimentation – with values required to address gender and poverty in rural development (Van Mele *et al.*, 2005).

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