

Report of the

**Capacity Development Workshop on  
Applying Innovation systems Concepts to Agricultural Research  
(22-24 Nov, 2005)**

Centre for Research on Innovation and Science Policy (CRISP), Hyderabad

**Background**

Agricultural research organisations in developing countries have been tasked with finding ways to improve their relevance and impact on key development indicators such as poverty reduction and equitable economic growth. There is an increasing concern that the challenge of applying scientific, technical and other forms of applied research more effectively to agricultural and rural development is not simply one of strengthening technology transfer and information dissemination mechanisms. Increasingly this means reconfiguring patterns of interaction between scientists and the ever changing and expanding range of actors, markets and policies in which the process of social and economic change is embedded. This reconfiguration would necessitate applying new concepts to analyse existing patterns of interaction and to plan and implement new approaches.

Research in India on partnerships and institutional learning and change (supported by DFID's Crop Post Harvest Programme, 1999-2005) applied an innovation systems framework to analyse and understand these issues and have led to several useful insights on the value of using such a framework to understand innovation. These studies clearly revealed the emergence of a new non-linear paradigm of innovation in Indian agriculture mostly outside the public sector and the increasing challenges to embrace new ways of working within public sector organisations, especially those involved with agricultural research. Meanwhile, within the Indian agricultural research community, the need for institutional changes to deal with new challenges and opportunities began to be recognised.

As part of the National Agricultural Technology Project (NATP), the Indian Council of Agricultural Research (ICAR) initiated a series of organisational and management reforms since 1997 to meet the new challenges. Though these were useful to some extent, the need for organising agricultural R & D as part of a wider innovation system began to be recognised. ICAR is currently engaged in the process of finalising a new project (supported by the World Bank), the National Agricultural Innovation Project (NAIP) to primarily address these issues. The Centre for Research on Innovation and Science Policy (CRISP), while planning to organise a capacity development workshop for agricultural scientists explored possibilities of collaboration with the NAIP. The National Director, NAIP found this initiative interesting and useful and agreed to facilitate participation of few senior ICAR staff dealing with research management in this workshop.

**Participant selection**

Based on a request by the Director, CRISP, the National Director, NAIP sent letters to the 8 ICAR Subject Matter Divisions and 7 ICAR institutes to nominate a suitable senior research

manager. The Director, CRISP, sent letters to the Vice-Chancellors of 6 State Agricultural Universities requesting nomination of a senior research manager to participate in this programme. Though 20 participants initially confirmed participation, 16 of them attended including one international participant. CRISP brought together researchers who have been applying and promoting these concepts to lead this workshop.

## **Content Development**

The CRISP team developed the content and approach for this program based on their experiences from organising two previous such workshops, namely, the “Capacity Development Workshop on Rural Innovations-emphasising the post-harvest sector” (CRISP, Nov 2004) and “Applying innovation systems concepts in livestock research” (ILRI, May 2005). While the first initiative was an 8-day programme meant for mid-career professionals in research, development and NGO sectors, the second one was for 5 days, exclusively meant for livestock scientists at ILRI in Adis Ababa.

The content and approach for this programme was specifically designed to meet the special characteristics of the participants who are senior scientific staff involved in research management within ICAR and State Agricultural Universities (SAUs). Being senior managers, they couldn't spend more than 2-3 days for a workshop outside their own organisation. The CRISP team has a fairly deeper understanding about the culture of the participant organisations. Many of these relate to rigid professional hierarchy, centralised modes of planning, tradition of assessing performance in terms of only technology development, reluctance to report and analyse failures, and working independently due to strong mistrust of other agencies. Before introducing new concepts such as innovation systems, the participants therefore needs to be given an opportunity to reflect on these aspects and understand how some other organisations have addressed similar issues. The programme for the first two days was finalised initially and the third day (FN) programme was kept flexible to meet the emerging demands from the participants during the first two days.

## **DAY 1**

### **Introduction, Welcome and Ice breaking**

In this session, the participants were introduced to the research, policy interaction and capacity development work, the CRISP team has undertaken in the last 5 years on applying and promoting the innovation system concepts. The course objectives and structure was also provided. It was mentioned clearly that the approach would rely on tutorial-based, facilitated discussion sessions and that the participants would work as individuals and as members of small groups and that the programme would be using cases to analyse experiences, interpret and learn.

The objectives were listed as follows:

- a. Enable a better understanding of the innovation system concepts
- b. Provide analytical skills needed to tackle innovation in a more broad sense
- c. Build capacities for applying these concepts in agricultural research organisations

As part of ice breaking and also to reveal how the participants relate to each other as a knowledge system, the participants were requested to arrange themselves into an

organogram inside the workshop hall. Participants were requested to introduce themselves and their organisation while doing this exercise. They were told specifically that each part (participants in this case) has to relate to those above or below or next to them. Much debate followed among the participants and they finally arranged themselves into three groups: crop science, animal science and natural resource management-even the economists in the group were pulled in to join either the crop sciences or animal sciences. Much of the debate centred on organising themselves into scientific disciplines, which is one of strongest identification points for the participants. The participants were however reluctant to think about other ways of organising like ICAR and SAUs or on any other dimensions. Apart from facilitating interactions among all the participants, the exercise also revealed clearly the disciplinary bias among the participants.

### **Component-I: Identifying challenges for agricultural research organisations in the contemporary scenario**

Each participant was given a set of three cards to identify the challenges within their own organisation (one challenge per card), keeping in view the emerging challenges in the field of agriculture. After collecting all these cards, the participants and the facilitators sorted and grouped these cards around the major themes, as given below.

- Response to market demand
- Tasks beyond research mandate
- Keeping up with changing international food safety standards.
- Problems cannot be solved only by Research – need for multiple players/ actors
- Maintaining relevance in a rapidly changing world
- Working with 5 Ps (pro-poor public-private partnerships) involving farmers, research and industry partnerships
- Linking technological development with marketing development?
- Disconnect between Research and Policy-making
- Processes and Practices of Research Organisations
- Changing research agenda : NRM issues
- Changing research agenda : Equity issues

### **Reading case studies**

The participants were divided into 4 group and each group was given a case study to read, analyse and report back to the plenary. All these 4 cases (Box 1) discuss how different organisations responded to the changing external environment. Participants were asked to reflect on the thematic areas identified in the previous section and respond to the following questions.

- a. Identify the challenges faced by these organisations in these case studies
- b. How did the organisations deal with the challenges in these case studies?

All the 4 groups worked on each one of these case studies for 2 hours and presented back their analysis to the plenary. This helped the participants to unpack the partnership process illustrated in all these cases.

**Box 1- Cases used****Case 1. IDE- facilitation of Institutional Change and Innovation-**

This case study explores how an NGO, the International Development Enterprises (IDE) goes about the task of technology development and promotion and how it has built up and improved on this in two technological sectors, namely the treadle pump and packaging for tomatoes.

**Case 2. Andhra Pradesh-Netherlands Biotechnology Programme (APNLBP)**

This case study describes a project designed to build and deploy bio-technological capacity in ways relevant to the resource poor farmers. The project has been running for a period of ten years in Andhra Pradesh located formally within the Institute of Public Enterprises, Hyderabad.

**Case 3. ICRISAT's responses to a changing research and development environment**

This case explores the way ICRISAT responded to the changing research and development environment in the late 90s and early 2000's by entering into partnership with the private sector and the related response and changes that followed within ICRISAT.

**Case 4. New patterns of partnership in agricultural research in Africa: the SADC/ICRISAT Sorghum and Millet Improvement Programme (SMIP)**

It provides an overview of recent experiences from the SMIP programme in Southern Africa, a technology programme in which an explicit attempt was made to pursue a broad-based partnership approach. SMIP represented a long-term (20 years to date) investment in capacity building and agricultural technology development.

All the cases discuss how the organisations responded to the changes in the wider developmental context. This necessitated working in partnership with a number of organisations having different but complimentary skills. Partnerships helped them to apply their skills and expertise better to the needs of different stakeholders. The analysis revealed how different organisations select partners, the role of lead partners and the changing role of partners during the project phase. The case analysis also highlighted, the need to broaden the research/extension mandate, the kind of changes (in habits and practices) that were to be made within organisations to promote working in partnership, especially the need for flexibility and the need to take into account the time involved in developing relationships when dealing with new partners. The need for continuous reflection and learning from these changes to help organisations evolve new ways of working was also highlighted.

Participants also reflected on whether these kinds of changes would have happened in their own organisations. Some of the participants mentioned about the changes (especially decentralisation and delegation) that were brought about by NATP within their own organisations and how these facilitated better working practices (better interactions and knowledge flows among the actors). Given the right perspective and administrative support, participants felt they could do better, provided the right kind of evaluation parameters (of scientists and organisations) are used to judge performance. The need for supporting partnership development exercises within organisations was also emphasised.

**DAY 2****Component-II Agricultural Innovation System**

The purpose of the session was to explore the concept of an innovation system and the implications of using this concept in agricultural research. First was a presentation on innovation systems. This presentation illustrated (with examples and cases), the following aspects:

- a. the underlying concepts of this approach such as inventions Vs innovation, institutions Vs organisations
- b. Definition of an innovation system and how this concept helps in exploring partnerships and institutional issues in the innovation process
- c. Why there is a need to move from Research to Innovation especially in view of the new challenges
- d. How to build and promote innovation capacity
- e. How habits and practices (rules, norms, conventions etc) constrain/facilitate development of this capacity?
- f. The interrelationship between technological and institutional innovations
- g. Some of the potential ways to promote innovation capacity (team building, institutional learning and change exercises, foresight exercises, joint task exercise etc)

The presentation was followed by a discussion. Participants expressed several concerns on working as one of the actors within the wider innovation system. Some of them had real difficulties of conceiving any role for the research organisation beyond technology development (esp varieties) and farmers (as the only client). Though examples were shown to illustrate that technology is not often the starting point for agricultural and rural development, some of the participants have difficulty in accepting these. There were also fears on the motives of the private and voluntary sector, though much of them were not based on facts or experiences. Though importance of networks and relationships were appreciated, some of them argued strongly that the role of co-ordinating the innovation system should be with the Directors of Research in respective states (within State Agricultural Universities).

Several participants believed that the role of the public sector is to give finished technologies and other actors are only interested in taking these technologies for adoption of for promoting adoption. Everyone agreed that the current habits and practices within their existing organisations are not conducive to develop better relations with other actors or working with them. These habits and practices are to a large extent responsible for their organisations to respond effectively to the new challenges identified during Day 1. Though the participants appreciated the importance of the innovation system concept in agricultural research, they were apprehensive about operationalising these in their current working environment.

### **Exploring research system Vs Innovation System**

To further strengthen their understanding on the difference between a research system and an innovation system, the participants were asked to indicate these differences on some of the key aspects. The key aspects include: range of actors; role of scientists, policy and farmers; accountability; intended outcomes, key processes, patterns of interaction, key changes sought, indicators of success etc. This exercise was done in pairs (Each participant was asked to pair with their neighbour).

### **Using innovation system concepts to explore the past and plan the future-case analysis**

Two cases were used for this exercise, one on vanilla in India and the other on cassava processing in Ghana. These cases describe the historical development of these two sectors and discusses the challenges they currently face. Both sectors have witnessed innovations

that have led to useful social and economic outcomes, but there are also bottlenecks that are preventing innovation in the current situation.

**Box 2- Cases used**

**Case 1: Vanilla in India**

From a production base of practically zero in 1990, by 2004, a hundred thousand farm household were cultivating 1800 ha of vanilla, producing 80 tonne of vanilla beans. Vanilla prices have been consistently increasing since 1998 and during the period 2001-03 prices for uncured beans rose by 400 % and farmers realised large profits, This helped production expand and India rapidly become an important player in the international vanilla market. However, by 2004, farmers' faced sharply declining markets and by 2005 the Indian vanilla sector seemed set for collapse.

**Case 2: Cassava processing in Ghana**

Cassava is a major food staple crop in Ghana. About 55% of farming households grow this crop. It is also processed into a number of starch based products and rural households engage in small scale agro-processing techniques. As a consequence of its apparent developmental potential there has been considerable interest and investment in using cassava processing as a rural development entry point, an industrial developmental opportunity; and as part of an export led growth policy. However, by and large all these intervention approaches have contributed little to the creation of either a dynamic small scale or large scale industrial sector.

The participants were split into 4 groups, two groups worked on vanilla and the other two groups on cassava. The participants were asked to explain using the innovation system concepts, why innovation took place in the past and what could be done to promote the capacity to innovate currently and into the future, based on the innovation systems concept. The groups were requested to present their analysis back to the plenary on the following broad issues.

- Brief story of evolution of the sector.
- What have been the main innovations that have taken place in the sector in the past and what were the processes that brought these about?
- What triggers/ changing contexts are imposing new pressures to innovation?
- What bottlenecks are currently constraining the innovation process and hence the capacity to respond to the changing context?
- What interventions could be used to strengthen the capacity to innovate?

The analysis revealed the following aspects.

The common practice in agricultural research organisations is to look at only one aspect of the value chain, for instance, production, whereas what is important is to look at the entire value chain and decide what kind of research (and also how it has to be done) and expertise sharing that needs to be undertaken to promote the entire value chain. As the research has narrowed its role to only generation of production technologies, they are becoming increasingly irrelevant to the sector, as many of the problems rapidly emerging sectors face have to deal with aspects related to processing, development of new products, finding new markets, policy issues, fluctuating price and demand patterns etc. Though socio-economic research in agricultural research organisations can potentially do this, their role is currently narrowed down to evaluation of technology and understanding constraints in adoption.

Because of the narrow focus on technology, research organisations generally do not respond to the crisis in commodity sectors like vanilla or cassava. As research organisations do not function as part of a wider innovation system, they remain isolated and thereby getting

further marginalised. Moreover, the valuable technical expertise available in these organisations remains locked. The issues are not merely a matter of linkage or participatory technology development. This has more to do with how research organisations perceive and perform as one of the actors in the innovation system. Annual meetings with farmers (as part of *kisan melas*) or with industry (research-industry interface meetings) though important, rarely leads to institutional change. There needs to be qualitative change in the level of engagement and this would require taking varied roles as leaders, sub-ordinates, givers, takers, facilitators, learners, teachers, managers etc.

### **DAY 3**

#### **Applying innovation systems conceptual framework in participant organisations**

One of the participant, (Latha Bastine) made a presentation on the concept note she recently submitted from her parent organisation, Kerala Agricultural University (KAU), to the NAIP for consideration for funding. Latha made this presentation primarily seeking suggestions on improving the proposal.

This proposal envisages development of a consortium of all actors involved in coconut development in Kerala to promote technology adoption and value addition. Apart from KAU, which is the lead actor, the other actors included are the Central Plantation Crops Research Institute, Coconut Development Board, private industries, producer co-operatives etc. The major activities indicated are: analysing existing market; refining existing technologies in line with consumer preference; demand creation and market promotion; techno-economic support to private industries and exporters and development of supply chain

Though the proposal is innovative and has the right kind of partners, participants felt that enough thinking or preparation hasn't gone while developing this concept note. These were discussed in detail. Some of the observations are as follows:

- a. The partners mentioned in the concept note were not consulted during the development of the concept note. Neither the problem nor the way to address this has been discussed with the potential partners. These issues can potentially lead to lack of participation by other actors in this project. (The current rules and norms within KAU do not allow calling a meeting of the various partners for a brainstorming meeting to develop a concept note).
- b. The note rightly envisages hiring management expertise, but the rules and guidelines of KAU may either not allow doing this or could delay this process considerably affecting the whole project
- c. Taking a lead role by KAU can constrain operations as this project envisages considerable resource transfer and the current rules and guidelines do not favour this kind of an arrangement.
- d. Patterns of interaction between the different actors in the coconut innovation systems continue to remain weak. Unless the reasons for these weak links are analysed and addressed, developing strategies through forming a consortium of various actors may not succeed. Using tools such as actor-linkage matrix to explore relations can be of use in this regard.

The discussion clearly brought into focus, the challenges involved in developing partnerships and the need for institutional changes to facilitate partnerships.

## Wrap-Up

Participants reflected on the problems and opportunities in using the innovation systems concept in their own organisational setting. There has been a general realisation that innovation systems conceptual framework offers new insights and methods to operationalise partnerships in their working environment. But this would also need change in habits and practices in research organisations and in other systems. Several participants demanded reading materials and case studies on application of innovation systems and these were distributed in a Compact Disc at the end of the day.

## Feed back

Every participant was given an opportunity to provide feedback on the content and organisation of the workshop. This session was co-ordinated by one of the participant and he asked each one to comment on what went well and what can be improved. These are summarised below.

*What went well-* A new learning experience, first time exposed to this useful concept, use of case analysis as a workshop methodology worked well, helped in realising the need to move beyond technology development and an investment in time and funds by their organisation

*What could be improved-* Need more guidance on operationalising these concepts, would have allowed participants to present their own cases, include a few presentations by those organisations making use of these concepts, need more written materials, do this kind of workshop with senior policy makers.



## **Participants**

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15. Latha Bastine, College of Agriculture, Nileswaram, Kasaragod, kerala
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## **Facilitators**

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