Institutional Learning and Change (ILAC) at ICRISAT: A Case Study of the Tata-ICRISAT Project

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Background

Institutional histories have been used as tools recognizing the need for ILAC to document institutional innovation as one way of promoting institutional learning – the process through which new ways of working emerge. This report is the second phase of a pilot study on ILAC in an international agricultural research centre – the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). The first phase of the study looked at the evolution of ICRISAT's watershed-based research drawing out institutional lessons that hindered learning.

This report seeks to extend the approach of institutional histories to an ongoing project – 'combating land degradation' in India. The institutional history of the 'combating land degradation project' seeks to document institutional innovations in the project. In this project actor oriented tools have been used with a view to draw out of lessons, but these tools have been presented for use not just by outside researchers but by the scientists of ICRISAT and its consortium partners. The report is thus not meant to be a final statement on the project, but is more of a dialogue with the project seeking to make the project and ICRISAT scientists more sensitized to institutional learning and tacit knowledge. The report thereby also seeks to unpack the 'consortium approach' used by ICRISAT (Wani et al. 2003) and look at its implications for scaling-up strategies, and understanding the challenges this approach faces when working with dissimilar partners and partners who might have a different approach to science and technology for development.

This report has four parts. In the extended introduction the need to grapple with institutional issues in natural resource management (NRM) work is highlighted. The second part has the institutional history of the project based on interviews with scientists, field visits to the project sites and participation in a review and planning meet of the project and an enabled opportunity to minute the steering committee of the project. In the third part of the report, actor oriented tools have been used by the researchers to understand partnerships. However these have been presented more with a view on how the tools can be used by projects to help reflect on institutional lessons and plan operations rather than as statements on project performance. Finally, in part four we summarize some of the interesting institutional innovations by ICRISAT and its partners and draw a few generic lessons for improved performance of the CG centres.

Introduction

Recent research on impact assessment in the International Agricultural Research Centres (IARCs) has highlighted the weak diagnostic content of commonly used impact assessment methods and argued for a more learning oriented monitoring and evaluation. One of the major challenges for impact assessment if it is to lead to better practice is its ability to address institutional issues, those that concern formal and informal rules, regulations, norms and practices that govern and determine agricultural research and development (R & D) system. The articulation of a different approach to address poverty-alleviating impacts of technology associated with the Consultative Group on International Agricultural Research (CGIAR) has led to a community of social science researchers addressing institutional concerns under the broad framework of ILAC. It is seen as a process of continuous learning and unlearning – learning from what works and what does not; of acknowledging, managing and moderating asymmetrical power relationships within agricultural R& D system (Matlon 2003, Chambers 2003 and Mackay and Horton 2003).

One of the important differences of ILAC approach compared to the existing methods is in its understanding of innovation and research. Traditional transfer-of-technology approaches to agricultural research have proved inadequate in addressing complex, diverse, risk-averse and dynamic realities of poor farmers. Agricultural research, science and technology in ILAC are seen as part of a complex adaptive system that involve many agents other than research centres. Innovation, in this approach, is seen as something that is locally constructed and occurs not necessarily only when it is created by the research or scientific community but also when there is a creation and use of knowledge, often a creative imitation, for the adopting agent. Innovation processes are dynamic and not predictable; they emerge from self-organizing principles of the system as a whole and the way the system responds to opportunities and challenges. Impact of agricultural research thereby arises from strong networks, characterized by broad-based partnerships and evolutionary process, within the broader innovation system comprising of research and non-research actors (Ekboir 2003, Hall et al. 2003).

ILAC is not just another form of accountability to donors. A central implication of this approach is that institutional lessons emerge from the research process routinely, but are often not harnessed, recorded, synthesized, or promoted and have been under-valued as a way of improving the impact of agricultural research. ILAC recognizes the need to document institutional innovation as one way of promoting institutional learning, the process through which new ways of working emerge. It seeks to answer important questions about how partnerships emerge and evolve and how learning takes place through these arrangements. Through this it hopes to develop general principles that can promote changed ways of working within the CGIAR centres. Some of the approaches used for these are training of scientists in participatory reflection and learning methods; institutional histories; innovation histories; process documentation and action research methodologies (Watts 2003).

This report uses one such ILAC tool – institutional histories, to reveal generic lessons for practice for CGIAR scientists. It uses the case study of ICRISAT's work on watershed research to explore how agricultural research organizations are or can transform themselves into learning organizations. Following the principles of ILAC, this report attempts to focus attention on learning and the capacity of organisations such as ICRISAT to innovate not just technically but institutionally.

Watershed Research at ICRISAT

ICRISAT was one of the earliest CG centres to give formal recognition in its mandate to supplement research on individual crops with research into farming systems. Watershed-based research was an example of interdisciplinary research even before the term assumed significance. Despite this, watershed work has not been sufficiently understood within ICRISAT. Discussions of the work in formal settings at ICRISAT concentrated on disciplinary details of soil, water science and agronomy, and had substantially ignored the institutional learning that took place in and around partnerships. Institutional issues, it appears, played an important role in restricting research on-station and it was only after more than twenty-five years that the work went on-farm and through new partners. The watershed based work at ICRISAT in recent years has become one of its most visible activities with impact over several locations in the SAT (semi-arid tropics) region. Paradoxically this activity has been most affected organizationally by staffing and funding cuts[1] (FAO 2004).

1. In addition to decrease in core funds, the recommendations of Fifth External Program Review (EPR) of ICRISAT conducted in 2003 made it mandatory for ICRISAT to explore alternate sources of funding on a perception that the NRM research in Asia 'has no longer a comparative advantage' and that resources needed to be redeployed to Africa instead. ICRISAT in its response in principle agreed to this proposition and expanded activities in Africa. It was agreed that research in Asia would be continued through restricted funds available and ICRISAT would strive towards creating a self-supporting natural resource management team in Asia (FAO 2004 pp. xii).

The first phase of ILAC pilot study, an institutional history that documented evolution of ICRISAT's watershed based research work (Shambu Prasad, Hall and Wani 2005) sought to identify the institutional learning associated with this research and the factors that enhanced and hindered learning. The study had demonstrated that the scientists involved had enormous amount of knowledge on processes and approaches that have relevance to improved impact that included how to work with National Agricultural Research System (NARS), the challenges of multidisciplinary research and of working with social scientists and of promoting a different approach to dryland farming. However, these were inadequately articulated in a "scientific" organization which rarely forefront many of their institutional innovations in the same manner as they do for technical innovations. The institutional history revealed that excessive technical emphasis hindered learning of valuable lessons on processes and had prevented ICRISAT from playing a larger role in the evolution of NRM concepts within CGIAR.

The study also revealed a lesser-known fact that it was only after ICRISAT started working with a wider range of partners that learning was faster and impact more widespread. Partnerships at ICRISAT were only amongst research actors in the early periods that went on to include other developmental governmental agencies and non-governmental organizations in later years. The successful establishment of an institutional mechanism – the 'consortium approach' – led to development of a model watershed at Kothapally. Scaling-up in major areas has been one of the important institutional lessons for ICRISAT. The current study draws upon the insights from earlier study but takes it further. It seeks to unpack the consortium approach and how this approach has led, if at all, to changed behaviour of ICRISAT with other actors in the system. It looks at a current project of ICRISAT with an Indian non-governmental donor and seeks to capture real time learning and unpack the important institutional issues for scaling-up NRM. It also proposes an approach and tools that projects can use to facilitate the capturing and use of institutional lessons.

Scaling-up in NRM: The Institutional Dimension

Organizations involved in NRM work whether donors, research institutes or field level NGOs, extension services and policy makers have been grappling with issues relating to scaling-up of activities that are often different from other areas of agricultural development. It is recognized that complex innovations arising out of NRM research have not achieved widespread impact through conventional dissemination approaches (Gündel S, Hancock J and Anderson S 2001).

Unlike green revolution technologies that follow the 'technology transfer or pipeline models' of central production of embodied technology for use in homogenous agro-ecological conditions, technological upgrading in NRM usually deals with small-scale farming usually highly heterogeneous and complex – in physical and socioeconomic terms. Benefits of a new crop variety may spread rapidly via farmer-to-farmer dissemination of seed. Water-based technologies however require key, well-informed individuals for dissemination, joint action and focus on long-term benefits (Farrington and Lobo 1997).

Studies on NRM indicate the importance of working with different partners in order to facilitate scaling-up. The success of this is linked to the intensity and closeness in which communication and collaboration among partners takes place. Greater impact can be achieved through new innovative partnerships, in many cases in recognition of the important work done by NGOs in sustainable agriculture that have been more successful in mobilizing communities for collective action and impact. The Global Forum for Agricultural Research (GFAR) has for instance supported the CGIAR-

NGO Committee to identify cases and strategies for scaling-up, recognizing the need for wider impact (CGIAR-NGO Committee 1999, IIRR 1999, Kerr 2000). Inclusion of NGOs has led to changes in strategies and guidelines in places like India that has emphasized the need for community ownership of projects in what has since the 1990s been known as 'second generation watersheds'. This strategy was opposed to the first generation that was largely technical in nature and concentrating only on soil and water conservation. Institutional issues however still remain critical to success. In a recent review in India on scaling-up of watershed activities B N Yugandhar, Member of Planning Commission of the Government of India, remarked, 'The science for doing this is largely in place but the challenge is institutional. In giving a new lease of life to the program, institutional models of scaling-up without losing quality and impact are needed'.[2]

Partnerships are not without their problems. Operationally there are often differences in the research approaches needed for larger group-managed technologies and those for smaller individual farm-level actions. Action oriented agencies (such as many NGOs) usually prefer to work on a community basis, drawing on participatory approaches to group formation and technology development. Many village-level initiatives currently promoted by NGOs have little or no research link and no independent monitoring as an input to the scaling-up process. On the other hand, research organizations are usually mandated to work at the individual farm level. Biophysical scientists often have limited experience in the dynamics of forming the type of user group that is essential for water-based activities. In projects that have been led by research centres, researchers seem to document results and findings mainly for the scientific sector (Gündel S, Hancock J and Anderson S 2001).

A major conceptual challenge for conventional agricultural research approaches where knowledge is generated centrally and relies on public extension services and the market to scale this out to large number of farmers. Whereas embodied technological information distilled and packaged into discreet units, knowledge about local innovations in NRM systems is difficult to synthesize and codify often because it involves locally specific decision-making process involving complex and dynamic relationships. Contemporary approaches such as farmers' field schools and participatory research take on these ideas to varying extents as pointed out by Snapp and Heong (2003). Much of scaling-up and out has arisen out of a participatory response to these issues leading to approaches such as action research, participatory research and farmer field schools. These approaches emphasize empowerment and investment in human resource capacity to enhance local experimentation and adaptation efforts.

Despite the participatory ethos issues of scaling-up and out, seem to be less concerned with institutional development and innovation and is still looking for technological knowledge with wider applicability. There has been a tendency to focus on developing the capacity of farmers and introducing new forms of behavior amongst a restricted set of stakeholders – mainly rural communities. Less attention has been paid to changing the culture and behavior of wider development practice that would allow mainstreaming of lessons and institutional innovations from on going project experience.

A complementary framework that enables looking at process and institutional issues in natural resource management is the innovation systems framework. It sees innovation as a process through which knowledge is created *and* brought into use in significant socio-economical methods through the interaction of different sources of knowledge and users of knowledge. This knowledge can be technical institutional or managerial; it can be new and original knowledge but importantly also new uses or combinations of existing knowledge.

[2] B N Yugandhar. 2005. Keynote address, 'Future Directions for Integrated Watershed Development Program'. At the 4th IWMI-Tata Annual Partners' Meet, February 24–26, Institute of Rural Management, Anand.

A key element to applying the innovation systems framework in project implementation is focus on building system capacity. This involves partnerships often in the form of clusters or coalitions, now a regular feature of most NRM projects. However a large element of capacity is 'institutional' - patterns of trust and habits and practices (institutions) relating to knowledge acquisition, sharing and learning. It involves ability, through learning, to reconfigure itself in concert with changing circumstances i.e., it is an evolutionary dynamic capacity. Some insights that the framework offers for scaling-up and out are:

- It situates farmers in a much broader set of relationships and processes than many participatory approaches.
- It stresses that capacity development and institutional learning and change needs to take place with all stakeholders in the system - researchers, scientists, practitioners, policy actors and donors- and does not just concern farmers alone.
- It thus recognizes scaling-up and out is about changing behavior in broadly conceived systems involving the whole community of development practice (Hall and Shambu Prasad 2004a).

This report seeks to use this framework to reveal institutional lessons on scaling-up of NRM activities as it applies to the Tata-ICRISAT-ICAR project. With this backdrop on institutional dimension of scaling-up issues in NRM and ICRISAT's earlier work on watershed we now provide a narrative on an ongoing project, funded by Sir Dorabji Tata Trust (SDTT), a private Indian donor to ICRISAT.

Tata-ICRISAT Project – Institutional History

An institutional history is 'a narrative recording key points about the way institutional arrangements evolve and develop over time to create more effective ways of achieving goals to include lessons from this for others' (Hall and Shambu Prasad 2004b). It is a way of drawing and synthesizing general lessons and principles that can be used by others. Institutional histories seek to capture institutional innovations or the capacity to innovate that includes a wide range of other habits and practices (other than scientific and technical skills). These include the ability of the organization to acquire and share information, learn from experiences and take risks in the process, respond to demand signals from the stakeholders and other triggers to innovate in the external environment (Hall and Shambu Prasad 2004b).

Following its successful model watershed in Kothapally 40 km from Patancheru (ICRISAT's headquarters) and developed as part of the ADB project (1999–02), ICRISAT was keen to expand its operations to other regions. The project under consideration 'Combating Land Degradation and Increasing Productivity in Madhya Pradesh and Eastern Rajasthan' funded by Sir Dorabji Tata Trust (SDTT), Mumbai is part of this initiative. Kothapally, ICRISAT's first major direct on-farm involvement in NRM, was a turning point in its NRM research. Demonstrated success went along with a new mechanism – the 'consortium approach' that led to greater interest from the state government of Andhra Pradesh and the DFID (Department for International Development) funding ICRISAT for the Andhra Pradesh Rural Livelihoods Project (APRLP) on watersheds. Working with the state government for an international research centre, that earlier believed in working only with national research organizations, was an important institutional change. The APRLP project was scaled up to cover 50 watersheds by 2004 and was seen as unique 'since for the first time, a consortium of research institutions, developmental agencies and non-government organizations are working with farmers'. ICRISAT believed that technical backstopping of a consortium of partners for sustainable watershed management was indispensable and this approach was sought to be replicated in the 'Combating Land Degradation Project' as well.[3]

[3] W D Dar. 2004. 'Managing Drought: Lessons from the APRLP-ICRISAT Project'. Inaugural address for the National Workshop on Drought Management Strategies: Lessons from the APRLP-ICRISAT Project, 18 March, ICRISAT-Patancheru. http://www.icrisat-intranet.org/dg/presentations/2004/Managing_drought.htm accessed 21 April 2005.

While ICRISAT NRM team worked with Indian governmental agencies, working with a private Indian donor was a significant institutional innovation. This novel partnership between an international research centre and a private donor in a consortium mode, it was hoped, would influence the functioning of the biggest player in the NRM scenario in India – the Indian government.

Evolution of the Project

The Sir Dorabji Tata Trust, Mumbai, established in 1932, receives funds from one of India's largest industrial houses, the Tata Group of Companies as part of its philosophy of 'Constructive Philanthropy' where the Trust funds proposals seeking to contribute to nation building and pioneer new ideas with far reaching beneficial impact on society. In recent years, the Trust is embarked on a proactive, purposeful and energetic commitment to understand and deal with a wider gamut of current issues and challenges of development sector in India.

NRM has been one of the core areas of the Trust since its inception and the Trust had gained rich experience of working with a wide range of non governmental organizations (NGOs) and community based organizations (CBOs). These organisations have a reputation for innovative work in their fields. To this largely NGO focus, the Trust in recent years felt it was necessary to identify and support organizations that would 'connect global environmental negotiations with the traditional wisdom of our communities' (SDTT 2000–02: 11). In this renewed mandate of the Trust, ICRISAT's work became important. Despite common linking points, the renewed mandate or Trust and ICRISAT's new challenges in Asia due to funding cuts, the two organisations were able to work with each other four years after their first meeting. This prolonged history of interaction is indicative of the kinds of institutional changes that ICRISAT as an international research centre has been going through in recent years.

The initial interaction of the Trust with ICRISAT in 1998 was lukewarm as the Institute at that point was not keen on 'unconventional donors' and ICRISAT was still involved in on-station activity. Despite the subdued response from ICRISAT, a connection was maintained at a personal level between Mr Gorakshkar, Program Officer from the Trust and Dr Wani, a scientist from NRM team. The personal rapport came handy a few years later when ICRISAT underwent internal changes and faced fund constraints for its activities in Asia. The new leadership at ICRISAT in 2001 was keen on exploring the possibility of a collaborative partnership with the Trust and Dr Wani of the NRM team of ICRISAT contacted the Trust to discuss the possibility of funding.[4] Mr Gorakshkar of SDTT also visited ICRISAT and was pleasantly surprised by the attitudinal change. The meeting included the DG along with a team of scientists. The DG then made it a point to visit the Chairman of SDTT, Shri Ratan Tata in Mumbai. Clearly these were institutional changes that could not be easily associated with ICRISAT a decade earlier.

Internally too, ICRISAT was better equipped in 2001, fresh from the confident experience of working in India on farmers' fields following the Kothapally watershed. ICRISAT was keen to scale up its activities, the donor was however keen on the location, namely Madhya Pradesh and Rajasthan to which ICRISAT responded positively. The donor in this case was also keen on introducing stronger social emphasis and keen that ICRISAT's successful efforts on the technical front should also look

4. One of the factors affecting change in perceptions of ICRISAT towards the Trust is related to changes in leadership and funding strategy of the World Bank resulting in less financial support to the CG system. In funding the CGIAR system, the World Bank changed its strategy from 'donor of last resort' to that of providing a 'matching grant' proportionate to contributions from individual donors. In changed context of decreased 'core funds', it became mandatory for ICRISAT to look for funding from other national and international funding agencies.

into issues of equity and sustainability while attempting to scale up watersheds. In its earlier reliance on an institutional arrangement of providing international public goods to the national agricultural research systems (NARS) the issue of scaling-up was in a sense indifferent to the location. However in the newer consortium model, extending the area of operation and with direct involvement in the field was indeed a major challenge. Following the discussions with ICRISAT, a team from the Trust along with a reviewer Dr Balasubramanian (social scientist from M S Swaminathan Research Foundation (MSSRF)) visited ICRISAT to discuss the project. They also visited Kothapally to get an overview of work done there by ICRISAT NRM scientists.

Though not articulated explicitly, the donor had an agenda that went beyond a funding agency. In a recent review meeting, this was articulated and shared with the project partners. The program officer of SDTT mentioned that the donor saw the project also as an opportunity to:

- Consolidate the working relationship between ICRISAT and civil society institutions;
- Understand the dynamics of the consortium approach and
- Study the functioning of the state agricultural universities (SAUs).[5]

It is clear from this that the donor was truly 'unconventional' and had a clear agenda. It wanted to be an active player by participating in the project and building up its capacities along with those of its partners. This articulation also meant that the donor saw itself as a learning organization, and not only as a conventional donor. It saw itself as creating a learning environment/platform in the project for the project partners as well. One of the concerns of the donor as articulated in an interview was 'how can this project help my ten other partners who are not part of this project and what should we be doing to enable this'. This vision clearly facilitated greater learning possibilities. The donor would bring to each meeting of the project partners at least one expert who would often raise 'inconvenient questions to ICRISAT and to the other project partners'.

An interesting feature of project design was a different model of scaling-up that involved a buy-in of key policy actors in the system. The project was not seeking to physically take up scaling-up activities for the two states but it hoped to provide a model and a method for the state governments to do so. To enable this, the state governments of Madhya Pradesh and Rajasthan were included as partners in the consortium. If successful, the project would provide a model to the state governments to replicate and scale it up in other semi-arid districts of the respective states. There was initial apprehension within the Trust on involving state governments given the history of forest department and people's conflict in many parts of India but the courage to make the experiment happen prevailed.

A significant aspect of this unusual coalition between a CGIAR centre and a private Indian donor was that despite it being a first time for both sides and an initial uneventful history of interaction, time taken from date of submission of project proposal to that of sanctioning was four months, one of the shortest for granting a project both for SDTT as well as for ICRISAT. At the time of grant, SDTT made it clear that the Trust could not provide entire project cost and that ICRISAT had to raise a matching grant of 50%. While finalizing partners, the Trust suggested Sewa Mandir as one of project partners. However as Sewa Mandir was not working in semi-arid tropics and was not located in Bundi the project area, ICRISAT suggested that Bharatiya Agro-Industries Foundation (BAIF) as an alternative that could be a partner based on its prior working experience.

Every actor in the project used their 'social capital' in working out partners and extending scope of the project thereby building networks with individuals and/or organizations working in similar fields. For instance, the Trust brought in Samaj Pragati Sahayog (SPS) into the project as a partner based on the previous working experience of the Trust with SPS. Similarly, ICRISAT has brought in its own social

5. Mukund Gorakshkar. 2005. 'Tata-ICRISAT-ICAR Project Planning and Review Workshop', Presentation at the Annual Partners Meet held at ICRISAT during March 22 and 23.

capital into the project by including research organizations like IISS, CRIDA, NRSA, BAIF and JNKVV as ICRISAT had worked with these organizations at one point of time in the project funded by the Asian Development Bank (ADB). Though the initial project proposal did not mention any project partners, the list was finalised in time for the project launching workshops in 2002. Representatives from the funding agency, various research organizations and NGOs selected to be project-implementing agencies were invited to participate in the workshop. Similar workshops were held at Bhopal and Jaipur with a view to build in interests and buy in by the respective state governments (details of Time Line in Annexure I).

For implementing the project, ICRISAT had to put institutional mechanisms in place – both internal and external – to review progress of the project from time to time and to take policy level decisions. A national level Tata Steering Committee also called Project Advisory Committee (PAC) at the state and district level was constituted. Internally, in addition to the existing mechanisms of project implementation, ICRISAT had to place a team of visiting scientist and technicians in the field, an institutional innovation for ICRISAT (Details included in the section on Institutional Mechanisms in project).

Inventory of Actors/Partners in the Consortium

The list of actors/partners in the consortium was thus an interesting mix of research and non-research organisations, not all of whom had experience of working together or in such a mode:

- International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Hyderabad.
- Sir Dorabji Tata Trust (SDTT), the funding agency for the project
- College of Agriculture, Indore affiliated to Jawaharlal Nehru Krishi Viswa Vidyalaya (JNKVV), Jabalpur - state agricultural university
- Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad - an ICAR institute
- National Remote Sensing Agency (NRSA), an organization doing basic research, Hyderabad
- Indian Institute of Soil Sciences (IISS), Bhopal - ICAR institute
- Maharana Pratap University of Agriculture and Technology (MPUAT), Jaipur - state agricultural university
- Institute for Social and Economic Change (ISEC), Bangalore - Research institute
- Samaj Pragati Sahayog (SPS), Bagli - NGO partner in Dewas district
- Bharatiya Agro Industries Foundation (BAIF) - NGO partner for Guna (MP) and Bundi (Rajasthan) districts
- Government of Madhya Pradesh
- Government of Rajasthan
- Farmers and self-help groups

Majority of the research organizations included in the consortium have been working in watersheds since 1980s and were thus natural choices for partners. Another factor, which had an important role in selecting the partners, was personal contacts between scientists in the research organizations and ICRISAT. Local research organizations like IISS, JNKVV and MPUAT were included in consortium because of their geographical proximity to project villages and familiarity with local conditions.

Besides the research organizations, another set of important actors is the NGOs working with farmers at field level. The NGO partners in this initiative are Samaj Pragati Sahayog (SPS, that has been working in predominantly tribal district of Dewas in Madhya Pradesh since 1994) and Bharatiya Agro

Industries Foundation (BAIF, operating in Bundi district in Rajasthan and Guna in MP since 1995). They were included as project implementing agencies (PIAs), due to their strong field presence and strong reputation for technical expertise and capacity development for integrated watershed development.

Table 1. Overview of activities undertaken in project

	Nature of activity undertaken
Measures for soil and water conservation	Construction of water harvesting structures, percolation tanks, strengthening of wells, vegetative bunds
Improved agricultural practices	Evaluation of improved crop varieties of soybean, chickpea, pigeonpea, groundnut, sorghum; conducting micro nutrient trials and best bet trials, vermicompost and NADEP; drip irrigation system; use of tropicultor
Livestock development	Establishment of artificial insemination centres and organizing animal health camps
Community-based activities	Income generation activities like village seed banks; vermicomposting; nursery raising; flour mill; promotion of fisheries; community waste land development; improved health practices; construction of soak pits; popularisation of soya diet
Capacity development	Organizing farmers' days; training programs and exposure visits for farmers to research organizations and Kothapally, environment clubs in school

Activities Undertaken in the Project

The focus of this report is more on the institutional aspects yet to appreciate these it is important to briefly look at some of the activities undertaken in the project. These have been briefly summarised in Table 1.

Across the project districts, different activities have been undertaken and different approaches have been followed by the PIAs to incorporate livelihood opportunities in their region.[6] For example in Bundi district, eco-clubs have been established to create awareness about importance of health, hygiene, and environmental conservation among school children. In addition to this, community wasteland development has been undertaken where 18 hectares of land was fenced to restore biodiversity. In August 2003, a 'Participatory Biodiversity Exercise' has been undertaken to assess impact of this exercise and to involve the communities (Dixit et al. 2005). In addition to this, the project also provides a revolving fund for washing powder production unit for packaging and procuring medicines for local primary medical centre in Bundi.

In Guna district, farmers were actively involved in vermicompost activity and during 2004–05 as many as 44 vermicompost chambers were in place. Along with horticultural plantations (mango, guava, lemon and gooseberry), farmers also undertook vegetable production. Guna district also witnessed a comprehensive survey using remote sensing tools with the help of the NRSA.

6. This is in keeping with the current approaches to watersheds that speak of watershed, plus what emerged in 1998, to describe 'new-look' watershed projects that would step beyond their usual remit in order to address the needs of marginalised groups of people, such as those with no land, women and the poorest of the community.
http://www.livelihoods.org/lessons/case_studies/lesson-andhra3.html.

SPS established an artificial insemination centre in Dewas with technical support from BAIF to cater to needs of 30 villages as part of the project. In addition to these, there has been cross learning enabled with BAIF staff visited project villages in Dewas to get an overview of activities undertaken by SPS. This visit enabled cross learning between two organizations and also strengthened relations between these organizations, which was hitherto not so strong.

Seed villages, which have been in the ADB project has been taken up by BAIF, has been included for income generation in the current project with for making pure seed available at the village level (Dixit 2005). Apart from these there were also several activities that happened at the project level.

In August 2003, ICRISAT signed a memorandum of understanding (MoU) with the Institute for Social and Economic Change (ISEC), Bangalore for providing a Ph.D fellowship (in UK) for three years to explore socio and economic issues related to NRM. In addition to this, a media fellowship was awarded to Mr Aniket Alam from *The Hindu* a leading national daily who visited project sites to document success stories in the project.

Institutional Mechanisms in the Project

Dealing with such a diverse and complex set of partners and relationships meant that ICRISAT had to establish new institutional mechanisms both internally and externally. These mechanisms are often not spoken in project reports for donors and yet these are likely to provide insights for cross learning across projects within research organizations. While most mechanisms need to be customized for local knowledge, there are some generic lessons that can be derived from these mechanisms on how scientists work in multidisciplinary teams internally and with non-research and policy actors externally.

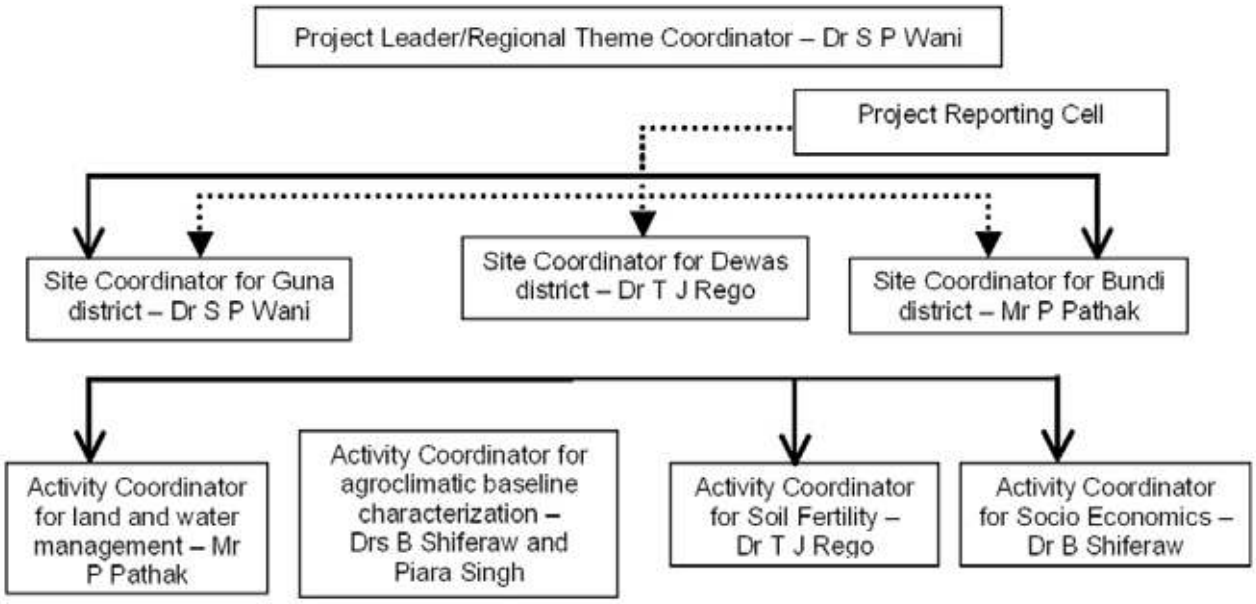
An interesting mechanism that had been set up in the project was the national level Project Advisory Committee (PAC) or Tata Steering Committee. The Steering Committee was constituted after identifying critical stakeholders in the project; representatives of the ministry of agriculture of Government of India, state governments of Madhya Pradesh and Rajasthan where the project is being implemented and Indian Council of Agricultural Research (ICAR) are part of the committee. Dr M S Swaminathan a widely respected person in the Indian and international agricultural establishment acts as the Chairperson of the Committee. The Director General represents ICRISAT on the Committee and the project manager is the member secretary. This committee meets once a year and reviews progress achieved in the project so far and also offers guidance to project team in finalizing future course of action. On behalf of ILAC initiative, we have been able to participate in the Steering Committee meeting held on March 24 2005, and also minute its proceedings. During this meeting, BAIF representative sought cooperation from other project partners particularly Chairperson of committee to interact with the officials from the government of Madhya Pradesh to enable effective participation from government line departments for implementing project activities.

In addition to the Steering Committee, constitution of state and district level committees to bring different partners at each level has been part of institutional mechanisms to enable implementation of project activities in the villages. These committees working in field would also communicate difficulties faced by the respective organizations in implementing project activities to the Steering Committee, which would then decide on the strategy to solve the problems. While the state level committee for Rajasthan is in place, constitution of similar committee for Madhya Pradesh has not been successful so far due to frequent changes in the administrative officials at the state level.

However the project team is making efforts to constitute the state level committee for Madhya Pradesh with intervention from the chairperson of the Tata Steering Committee.

In addition to the external mechanisms, ICRISAT also established an interesting internal mechanism to address project-related issues and provide the necessary technical backstopping. Such a model evolved during the ADB project and has undergone customisation since. There exists a three-tier structure for project implementation within ICRISAT. The project team is led by Dr S P Wani, who is the project manager and also Regional Theme Leader (RTL) of Global Theme on Agroecosystems at ICRISAT. He is assisted by a team of scientists and technical officers who help in implementing project activities. Reporting to the project manager are the site coordinators and activity coordinators who assist him in planning and execution of project activities. Besides being project manager, Dr Wani is also site coordinator for Guna district, Dr Rego looked after activities in Dewas till his retirement in June 2005 and Mr Prabhakar Pathak looks after activities in Bundi district.

Chart 1 – Project Implementation Mechanism at ICRISAT



Source: Dixit and Wani 2003. Integrated Watershed Management through Consortium Approach: Team building for watershed consortium, p. 29.

In the above diagram, variations in the thickness of the lines indicate differences in nature of interaction. While the thick line indicates direct interaction, the dotted lines indicate indirect interaction between the project leader and the site and activity coordinators.

The main responsibility of Activity Coordinator is to assist Project Leader by coordinating, planning, reporting and assessing progress of research activities in his/her area of expertise. He/she also serves as a focal point for communication with activity team members, site coordinator and project leader for efficient delivery of activity outputs. The site coordinator is to assist project leader in effective delivery of planned activities at the site through facilitating activities of Activity Coordinators. In addition, he/she is to liaise with government, NARS and PIAs for smooth planning and execution of project activities at sites (Dixit and Wani 2003). What is interesting in this mechanism is that not only

do the scientists have multiple roles that capitalize on their disciplinary specialisations but go beyond them. Each scientist, in the NRM team, including the project leader, has to at different points in time, report to another member and seek inputs for the team.

In addition to above-mentioned categories, there are visiting scientists who belong to different partner organizations and devote their time to project activities. In case of ADB project, visiting scientists who came in from CRIDA were located within ICRISAT and visited the project villages as and when the need arose, which was possible as the projects were close to ICRISAT. However in case of Tata project, an ICRISAT team was placed in the field as project districts were far away from the ICRISAT head quarters. Their primary difficulty was how to coordinate and monitor the project activities in these villages. Instead of sending its technical staff to the field at regular intervals, ICRISAT installed a field team [consisting of a visiting scientist and a technician in Rajgarh] who would take care of activities and provide technical support to PIAs in Madhya Pradesh; in case of Bundi a visiting scientist is located in Bundi and a consultant works from Jaipur.

The institutional history so far has explained the structure of the project and the institutional mechanisms. However implementation of the project, like most complex multi partner initiatives, has not been without problems and challenges. We highlight a few of the challenges that the project encountered and how the various actors/coalition members responded to them.

Challenges Faced in the Project

Considering the distance between project districts and ICRISAT head quarters, a unique mechanism of placing a Visiting Scientist of ICRISAT team was adopted for the current project. In addition to offering technical advice to NGO partners, the visiting scientist is also responsible for collecting research data and sending it to ICRISAT. In a sense, the visiting scientist acts as link between PIAs and scientists at ICRISAT.[7]

This mechanism worked well in Kothapally where there was no conflict in interest or philosophies between the NGO and ICRISAT as the NGO was not reputed for its technical skills in watershed management. In the Tata project, ICRISAT was dealing with reasonably competent PIAs with their own vision of technology transfer. While ICRISAT as a mandated research organization was used to sharing technology with the NGOs now instead of line departments of state governments or farmers, organizations like SPS believed in testing the technologies handed over to them through various projects in the demonstration plots before handing them over to the farmers. For the Tata project, there seem to have differences in the way ICRISAT and SPS perceived the 'visiting scientist'.

While ICRISAT felt that the Visiting Scientist (VS) would provide the technical guidance to the PIAs, SPS did not necessarily look at the VS as a sole repository of knowledge. This resulted in some friction with the NGO feeling that the choice of location of technical devices should be theirs. This conflict of approaches even threatened to snowball with the partner offering to leave the coalition. However, scientists at ICRISAT and also the funding agency played a crucial role in resolving the differences and letting SPS with the final choice. This was a case, to use Robert Chambers phrase on institutional learning and change, where the research centre had to 'acknowledge, manage and moderate asymmetrical power relationships within the agricultural R & D system'. A mature decision in the matter not only helped the NGO but also importantly brought in some very interesting technical

7. It may be noted here that ICRISAT in its earlier work rarely ever placed technical staff in villages, the only ones who spent long time in villages were attached to the socioeconomic unit.

results that would have otherwise not been possible. Annexure II has details of the tests done by SPS on the varieties of ICRISAT. It is very clear that the quality of feedback on its varieties in this case for the region was indeed very high and contributed to the pool of knowledge.

Considering diversity of partners in the consortium, SDTT played an important role in enabling effective communication among partners. On any project related issue, a strong communication loop/ link exists that was initiated by the funding agency. When partners communicated with each other in form of queries, they marked a copy to the Program Officer of the Trust as well. If some query did not get any response, a representative from the Trust usually got in touch with the concerned organization/individual seeking reply to previous query.[8]

Of course not all the partners in the consortium have been as vocal as SPS. The donor played an important role in bringing SPS and ICRISAT together and facilitated a number of e-mail exchanges about varying perceptions on technology and development between research centres and civil society. It was felt that open conflict was much more desirable than a hierarchical acceptance of roles and non-articulation of differences. There were instances during the interviews where partners did feel that they needed more stake but it does not appear that they had not shared this during project meetings or with ICRISAT. Consortium members often projected their work plans in project meetings often as 'success stories' without opening the possibility of difficulties and challenges and discussion around that.

The novel idea of a Steering Committee was also not without its problems. Response has been very different from the two states - Rajasthan government being more cooperative and participative than Madhya Pradesh. Further it appeared that recent policy changes of not having the involvement of NGOs in watershed programs of the government affected the nature of the state level steering committee in Madhya Pradesh. Despite that what did appear was that the coalition was also pushing ICRISAT towards a role that it had not envisaged, namely policy advocacy. The donor and some of the partners felt that ICRISAT could leverage its scientific standing to influence policy as well. This has been an unexpected learning of the consortium and also an important challenge.

There were of course lots more challenges that we as researchers could not access as outsiders, much of it is tacit knowledge and resides with project management or the partners alone. This report is thus not meant to be comprehensive but to tease out some interesting lessons on institutional innovations for research centres and to enable greater reflection amongst these issues. In the following section we propose the use of actor-oriented tools to make projects and their partners more reflective and thereby contribute to institutional learning and change (ILAC).

Use of Actor Oriented Tools in Project Management

The actor-oriented approach, which evolved in the context of natural resource management, is concerned with mapping relationships and flows of information to provide a basis for reflection and action (Biggs and Matsaert 2004). These tools draw heavily from diverse sources such as social anthropological and social network analysis, stakeholder analysis, economic input and output models, agricultural information knowledge systems, processes monitoring and documentation, graphic theoretical techniques, communications system and analysis of behaviour of disciplines in agricultural science (Biggs and Matsaert 2004). The first stage in using actor oriented tools for effective project management is identification of key actors who bring about or prevent change in an innovation system i.e., actual drivers and preventers of change. These tools provide inputs for:

8. In personal conversation with Mr Mukund Gorakshkar, Programme Officer, Sir Dorabji Tata Trust (SDTT), Mumbai.

- Mapping a given innovation system visually and analyze strengths, weaknesses and opportunities in the system;
- Encouraging technology users to look at existing (often unexpected) strengths in an innovation system and analyze its institutional implications;
- Providing a framework whereby actors in a specific innovation system have been able to change their perceptions of their role and relationships to other actors in the system and
- Providing tools for planning, monitoring and evaluating coalition building and information flows and give appropriate tools to be used by groups in coalition building.

These tools are valuable in keeping partnerships, relationships and sharing information high on research agenda. They often provide a more structured way of strengthening institutional innovations that are already taking place, but their importance has not been acknowledged (Biggs and Matsaert 2004). Though in initial stages, these tools are used to map nature of interaction between different stakeholders, at a later point these tools can be used for monitoring and evaluation of project and also gain reasonable clarity about the nature of issues that might be responsible for friction between stakeholders.

In this study, these tools were used partly with a view to understand the project better and construct a richer institutional history. At another level the idea was to use these tools to evolve a heuristic if not a methodology for projects to undertake their own institutional histories. For this report it needs to be clarified that the use of these tools has been based on information available through interviews with consortium partners and field visits to project sites. We made a presentation to the group during a recent project planning and review workshop following which developing these tools has become partly participatory. Drafts of actor linkage matrices were sent to PIAs to get inputs on how they saw each other's role in the project. This experience has been interesting.

The fact also remains that we were unable to elicit responses from many actors as the exercise was different and we could not explain it sufficiently. However there we revised what we had written based on the scientists inputs that what they had to offer was an approach rather than specific techniques. This is interesting from an ILAC point of view because the tables enabled thinking amongst scientists on institutional issues and we believe these tables can be used to precisely generate such discussions. Here we would offer a word of caution that these maps and matrices are based on information available to us and they would be different if constructed by project partners themselves.

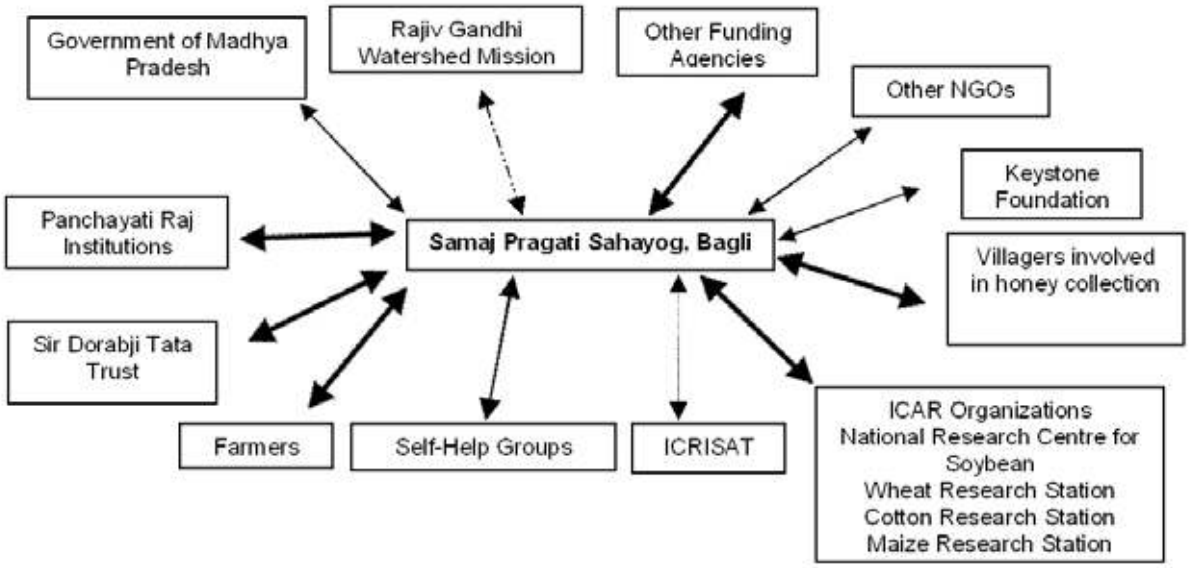
Actor Linkage Map

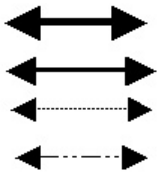
Actor Linkage Map is a useful starting point for discussing relationships and flows of information in an innovation system. An Actor Linkage Map depicts flow of information between key actors identified in the project timeline. It is useful in providing nature, frequency and intensity of interaction between different actors in the project. Actor Linkage Maps are particularly useful in focusing on one particular actor in the innovation system and his/her linkage with other partners. However researchers (Biggs and Matsaert 2004) who used these tools argued that as the number of actors' increases, a map can become too complex; at this juncture, they suggest that it would be useful to work with maps as part of the system or move to an Actor Linkage Matrix (ALM).

Actor Linkage Map for Dewas district

While testing utility of these tools for current project, we have constructed Actor Linkage Map for Dewas district by identifying key actors with whom SPS interacts regularly and map dynamics of interaction whether it was strong or weak. The Actor Linkage Map for Dewas is depicted in Chart II.

Chart II: Actor Linkage Map for Dewas district





Two way strong linkage exists between SPS and stakeholder group
Two way linkage exists with scope for strengthening
Two way linkage exists but is weak
Two way linkage existed but does not exist any longer

understanding the networks of an organisation and helps place the project within that context. Thus the chart indicates how SPS has several interactions with diverse actors even before the project, some partners it knew before the project and some evolved and arose because of the project. Samaj Pragati Sahayog for example shares a two-way strong relationship with the Trust as they have been working with together since 1998. Besides the Trust, SPS also shares a strong two-way interaction with village level *panchayati raj* institutions, other funding agencies, line departments of government of Madhya Pradesh, Keystone Foundation and also farmers and SHGs. It also has strong linkage with local ICAR organizations and that linkage between SPS and ICRISAT is weak. Though the Map provides linkages between different actors, it does not reflect on asymmetric power relations between different actors. Also we have realized that the Map had become more complicated with more actors. Then we had shifted from an Actor Linkage Map to Matrix for two project districts.

Actor Linkage Matrix

The Actor Linkage Matrix (ALM) is an important tool that plots linkages between key actors in an innovation system. The Matrix is similar to the Map in that it identifies all the actors and shows links between different actors in an innovation system. In the Matrix, actors are listed along vertical and horizontal axes and cells in the Matrix represent flows of information from actors in rows to actors in the columns (Biggs and Matsaert 2004). One of the significant distinctions between Map and Matrix is that while in the Map, linkages are plotted between all probable actors and not just main ones; Matrix is useful to summarize and analyze findings and also to plan, monitor and evaluate change. The advantage with ALM is that it can deal with complex situations and more number of actors; as it has a cell for every possible linkage; it encourages exploring all possibilities in partnerships.

Filling in the matrices can prove tricky and we had to go through several iterations. We later realised that encouraging the partners to fill an input output table as below is often useful before assessing the relations.[9] These tables seek to answer the question more directly on what is it that each partner gets from the other or more pertinently from the project office. We prepared input and output tables (describing inputs received and outputs provided by each organization) for ICRISAT as well as three districts (Guna, Dewas and Bundi), which has been quite useful. These tables enable the partners to reflect on their role and also roles of different actors in the project. It helps in identification of gaps in partnerships and also provides scope for including newer partners to strengthen the partnership.

Input Output Table for Tata-ICRISAT Project

Table 2 indicates the inputs that ICRISAT provides to the partner organizations and what it receives from these organizations.

In this project, ICRISAT also provides soft inputs to PIAs in terms of training, providing technical support, new ways and options for sustainable management of natural resources. Local research organizations, besides offering their knowledge base of local districts, also contribute towards capacity building in terms of conducting training camps and participating in farmers' days organized through the project. During the project period, farmers from Bundi, Guna and Dewas had visited ICRISAT and also Kothapally to look at watershed work in this village. For assessing the nature of interaction between the project partners and non project partners who are likely to affect the project work directly, similar tables have been constructed for project districts to enlist as to what inputs each organization provides and also what it gets from the other partner and non partner organizations (Annexure III).

Tata-ICRISAT Project – Actor Linkage Matrices

For constructing ALMs for the project, we tried different methods. To start with, we used a method wherein we mapped interaction between project partners (whether they interacted with each other prior to the project or interaction started through this initiative) using different colour schemes in the Matrix. But this was not as useful as expected. Though it provided details as to when interaction between two organizations start, it did not capture the power relations between partners.

9. The researchers would like to acknowledge Andrew Barnett who suggested the use of these tables in a Crop Post Harvest Programme (CPHP) workshop on institutional histories at Uganda in 2004.

Table 2. Input and Output table for Tata-ICRISAT Project

Agency	What it provides for ICRISAT	What it gets from ICRISAT
SDTT	Financial resources for project; networking with other NGOs and CBOS	Technical/research knowledge to be put to use at field level, international perspectives and best practices.
JNKVV	Expertise in rainfed districts of Madhya Pradesh	Links with international partners, funds and new knowledge
CRIDA	Participation of scientists from CRIDA in partners meets, project activities	Links with number of partners (national as well as international)
NRSA	Provides maps of the different regions by using remote sensing and GIS technology	Research partnerships along with agricultural expertise. Opportunities for learning and research at watershed scale.
MPUAT	Training to BAIF staff and farmers through exposure visits, participation in farmers' days	Exposure to new approaches and links with partners.
IISS	Analysis of soil samples; capacity building through exposure visits and training programs	Development of benchmark watersheds in IISS campus, technical support, funds and international linkages
SPS	Information from baseline surveys (social and economic profile of area); feedback about performance of various technologies and seed material as season wise reports	Improved seed varieties, micro nutrient trial, automatic weather station, runoff recorder, tropicultor; yields for different crops; information dissemination during farmers' days; links with BAIF
BAIF	Responsibility of project implementation in Guna and Bundi districts; Information from baseline surveys; feedback about performance of various technologies and seed material; expertise in livestock development for establishment of AI centres	Improved seed varieties, micro nutrient trial package, automatic weather station, runoff recorder, tropicultor, Simulation models for potential yields for different crops; printed material for distribution during farmers' days; technical support
GoMP	Policy level guidelines provided by the government agencies	If successful, technologies can be taken up for scaling-up
GoR	Policy level guidelines and on ground support provided by the government agencies for project activities	If successful, technologies can be taken up for scaling-up
ISEC	Dealing with social science issues in the area of NRM	Fellowship to a Ph.D student for study in Guna district
Farmers	Feedback in terms of performance of varieties, improved management options and adoption of improved technologies, performance of tropicultor	Improved varieties of seed material, micro nutrient trials, tropicultor, new knowledge
SHGs	Knowledge and training; Income generation activities – establishment of village level seed banks; revolving fund for washing powder unit and primary medical centre	Impact and better participation

Then we used another way of mapping the power relations between different partners in terms of characterizing relations between partners as being strong, medium and weak. However this exercise did not provide us with useful information as to why a particular relation was strong or weak, whether this was related to duration of interaction between two organizations or was there other factors affecting the relation. Having realized this, we tried a combination method wherein we tried to map interaction in terms of strong, medium or weak and also mapped whether interaction between two organizations started with current project or existed prior to the initiative. In mapping duration of interaction, we decided on a colour scheme to illustrate whether interaction started with this initiative or existed independent of the project.

In the colour scheme for the ALM, we used pink to indicate that interaction between two organizations emerged through the project; brown was used to indicate that interaction existed prior to project intervention and blue to indicate that interaction existed independent of project. For the project, three ALMs - one for project, ALM for Dewas, and ALM for Guna - were prepared based on information available with us (Annexure iv, v, vi). Information collected during field visits and also interviews with representatives of different organizations was used while filling boxes in the ALMs. The boxes were left unfilled in cases where we did not have any information regarding the nature of interaction; the other case when boxes were left unfilled were when there was no direct interaction between two organizations. In order to incorporate perceptions of different stakeholders in the project in the ALM, it would be ideal to have the partners to construct the ALMs during field visits, which we have not been able to achieve yet.

The Actor Linkage Matrix of the Tata-ICRISAT Project (Annexure iv) listed project partners along vertical and horizontal axes. For the project, organizations with diverse mandates ranging from research organizations, government departments, NGOs, farmers and self-help groups were part of the project consortium. Three variations have been observed as to how interaction between different organizations got initiated which are given below:

- In the first instance, interaction existed prior to current project wherein the organizations have already established working relationship as in case of most research organizations included in project consortium. For instance, ICRISAT's relation with CRIDA, JNKVV, IISS, NRSA and BAIF in the ADB project. Similarly the Trust had strong relations with SPS since 1998.
- In the second instance interaction between two organizations got initiated through the current project as in the case of SPS and ICRISAT, MPUAT and BAIF.
- The third variation that was observed in the project was that interaction between different actors working in a region existed independent of the project. This was particularly true of the NGO's relation with line departments of Madhya Pradesh and Rajasthan.
- It also indicates that though some organizations (organizations like NBSS and LUP and Sewa Mandir) have been initially considered to be part of the current project, they were not included as partners. However, representatives from these organizations are invited to partners' meets to seek their expertise.

In addition to the project ALM, the district wise ALMs for Dewas and Guna were also constructed. ALM for Dewas (Annexure v)illustrates diversity of project and non-project actors with an interesting combination of research organizations, NGOs, line departments of Madhya Pradesh government. The ALM also indicates that interaction between ICRISAT and SPS started with this initiative, which has been weak initially, but is emerging to be stronger with interactive mediation from funding agency. Another interesting aspect evident from ALM is that a strong relation existed between SPS and *panchayati raj* institutions prior to and independent of the current project. While interacting with

line departments, SPS finds that government policies are sometimes enabling and disabling in certain contexts. For instance in this project, SPS has faced stiff resistance from forest department officials who argue that rules do not permit any activity to be undertaken in the forest area. The ALM also indicates that there is no direct interaction between Indian Institute of Soil Science, Bhopal and SPS though both these organizations are in the same state, reasons which are not clear to us. It is for the first time that SPS and BAIF have been interacting with each other through the current initiative where SPS has been able to put to use the expertise available with BAIF in the livestock sector.

ALM for Guna district (Annexure vi) in Madhya Pradesh demonstrates diversity of actors with whom BAIF interacts and that linkage between ICRISAT and BAIF existed prior to current project from the ADB project. It is interesting to note that IISS offers technical support to BAIF staff in their watershed work and also enables farmers to visit IISS as part of capacity building. In case of all project districts, it would be interesting to note that though CRIDA and NRSA are listed as partners in project consortium, their inputs are in terms of offering strategic advice inputs for planning and monitoring project activities using satellite imageries, agroforestry and training and advice at technical workshops and partners meets. Inputs of strategic institutions at field level development are minimal.

ALMs can be used quite effectively for project management. The matrices are quite dynamic and the set of actors and their importance can and usually change with time. Often new organisations can be placed in columns and rows to start a discussion on what needs to be done to strengthen the relations between actors in a project meeting. This can throw up interesting ideas for action. We have of course not been able to use the ALMs in this project with such a purpose.

Summary and Discussion

The project has witnessed several institutional innovations for an international agricultural research centre like ICRISAT, the main actor in the coalition studied in this report. Not all of these have been reported in project documents nor do we claim to have captured all in this report. In this section we summarise a few learnings and institutional innovations.

Scaling-up and Changing Nature of Partnerships

Partnerships are not new to ICRISAT; however the nature of partnerships has undergone change over time. Earlier partnerships of ICRISAT were with research organisations alone and based on an implicit model of technology transfer through the NARS that were seen as a link between ICRISAT and farmers. Such partnerships increased in dimension in the crop improvement area through networks such as the Asian Grain Legume Network (AGLN) and Cereal and Legume Asia Network (CLAN) in later eighties and early nineties. In more recent times public private partnerships have emerged in several CG centres including ICRISAT, which now has arrangements with the industry on seeds and on bio-pesticides as well. However the partnerships seen in watersheds have been of a different kind and mainly with NGOs. Clearly the organisational cultures of these and ICRISAT have been very different. The project has been a great learning for ICRISAT on how to work with NGOs which goes beyond watersheds. The project demonstrated the need for ICRISAT to 'accommodate asymmetrical power relations' and learn to listen to partners more closely and value their expertise.

Discussions with scientists revealed that partnerships with NGOs are not novel for ICRISAT; an interesting model emerged with donors such as International Fund for Agricultural Development

(IFAD) in the case of integrated pest management (IPM). It however appears that these experiences on learnings with diverse partners are not sufficiently discussed within ICRISAT. Though ICRISAT scientists have had long history of working in partnerships for different projects, there has been no common platform within ICRISAT to enable cross learning among these scientists working in partnerships. Research managers would do well to enable cross learnings across projects in complex environments. The agroecosystems group of ICRISAT has a lot to offer and learn from other projects in this regard. These include critical insights on the manner of selection of partners, processes to accommodate differences and mechanisms for joint learning between dissimilar partners and institutional lessons for scaling-up operations.

Donor Fostering a Culture of Innovation and Learning

The current project provided ICRISAT with a chance to work with 'unconventional donors' i.e., Sir Dorabji Tata Trust. The donor has played an important role in creating a learning environment within the project. The Trust felt that while the scientific expertise available with ICRISAT should be brought to the field to be used by farmers, it also believed that ICRISAT should expand its mandate of being a scientific organization by addressing social science questions of equitable distribution of benefits and achieving sustainability – questions raised by field level NGOs. The donor saw itself as enabling this debate and worldviews of research and non research actors both formally and informally. Thus it always brought to the annual partners meet experts from other regions of the country who could reflect and ask questions for the project partners to address in their individual fields. Informally the donor created a platform for exchange of views and ideas amongst partners through e-mails wherein partners ended up discussing even controversial topics.

The donor also had a clear vision of seeking to expand the learning from the project to a wider base of stakeholders. One of the important questions that engaged the donor was 'how can a particular technology or approach benefit my ten other partners who are not involved in the current project.' The donor consciously sought to expand the network involved in project and also played a role in changing perceptions of ICRISAT in some instances. One such was between a reputed NGO in Rajasthan that believed that ICRISAT's varieties were expensive and that the scientists difficult to work with and remote from field level realities. The donor was able to enable a change in such perceptions using the project experience. The very fact that NGOs such as SPS often seen as 'activist' and 'political' have been able to work with ICRISAT has been an important learning of the project and the donor played a role in enabling this. While it might be argued that not all 'unconventional donors' are like SDTT, the important lesson for ICRISAT and other CG centres is that there is a need to look for donors who are willing to, in the true sense, act as project partners. The social capital and longer-term benefits from such arrangements cannot be underemphasized. ILAC needs unconventional thinking from research centres and 'unconventional donors' might in fact have ways of making that happen.

Responding to Opportunities

ICRISAT for its part has through this project shown that a key factor in scaling-up operations in NRM is the ability of research centres to respond to evolving opportunities. The forward-looking response to 'unconventional donors' has been one such instance. At another level ICRISAT has initiated several interesting institutional innovations such as experimenting with a fellowship to a Ph.D student to look

at groundwater use and watersheds and providing the project areas for study. ICRISAT also engaged a journalist to cover watershed related issues in the media. ICRISAT also innovated in getting that an official from APRLP has been part of the project team at ICRISAT as a scientist in the project team so that her experience could be used for this project. More recently ICRISAT has enabled the inclusion of the program officer from SDTT into the project team in newer watershed activities in Karnataka. The project has several instances wherein the social and technical aspects have been combined in interesting ways. If on the one hand a government official has been taken in as a visiting scientist, a usually strictly technical post, on the other, ICRISAT scientists have been doing socioeconomic evaluations of parts of their projects. While it is true that impact assessments is best done by independent authorities, the interesting thing about scientists being involved in the process at the field is more from a learning point of view. The scientists in this case have had a great opportunity to appreciate the complex socioeconomic environments that they seek to impact on through their technologies.

Changes in Research Practice and Incorporating Diversity of Approaches

There have been some interesting changes in research practices followed by ICRISAT in the project. Some of this is more visible while others have been subtle. There has been a shift from on station trials to location specific participatory research trials. This warranted that ICRISAT put new institutional mechanisms in place like placing a visiting scientist in the field, which was a good innovation in itself. However, as role and responsibilities of the visiting scientist were not clearly defined, initially it has led to difficulties while interacting with field level PIAs. As skills required for visiting scientist are diverse and goes beyond technical competence alone, there has to greater role clarity and training of incumbent of this important position who acts as a vital link between ICRISAT scientists and PIAs. The absence of role clarity could as we have seen in the project lead to conflict.

There is sufficient experience in the project to have a greater definition of these positions which represent quite a shift in the way international research centres have worked in the past and such a definition and reflection would lead to improved performance across several projects. With increased cuts in funding many projects have taken recourse to such arrangements but they have often been ad-hoc and candidates are often tested only for technical skills or extension and social skills, whereas the job actually seems to demand a good combination of both. External to ICRISAT is the need for ICRISAT to be open to alternate interpretations of innovation. While most research centres assume a linear model of innovation or the transfer of technology model, the project demonstrated an interesting example where one of the NGOs chose an alternate model and ended up giving more locally specific feedback than the conventional field trials. The quality of feedback on ICRISAT's varieties by SPS was of a very high order.

Role of Social Capital

As in other collaborative projects, social capital of different agencies built over previous working experience played a crucial role in bringing partners together for the Tata-ICRISAT project. For instance the Trust got SPS as a partner based on its previous working experience and ICRISAT got BAIF, CRIDA, NRSA and JNKVV as project partners based on previous working experience. Besides using social capital for bringing project partners together, the Trust also uses its social capital to invite experts in other organizations which are involved in other projects and are not part of this initiative to project to participate in the partners' meets.

Unexpected Outcomes

During the course of project implementation, there have been certain unexpected outcomes that emerged. One such was the possibility, even a demand from partners, that ICRISAT should leverage its reputation to bring about policy change both in specific states and the country on watershed practice. This was seen not as a way of an international centre speaking down to local governments but more as a necessary step for the consortium to be involved in scaling-up operations. Policy advocacy is not normally seen as the mandate of CG centres especially at a regional level but the project seemed to think that ICRISAT has an important role in this.

Another unexpected outcome of the current initiative has been that by working in the current project, it has provided opportunities for the partners to work with other agencies as well, as in the case of BAIF working in partnership with ITC in their e-choupal scheme. Along with this, working with different partners has created opportunities for ICRISAT as well as ICRISAT being recognized to provide 'technical backstopping' by the Madhya Pradesh Rural Livelihood Programme (MPRLP) for their watershed initiatives. Also through the current project and also the initiative of the funding agency, perceptions about ICRISAT among partner and non-partner organizations have undergone a shift. Though there had been differences between SPS and ICRISAT in initial phase of the project, interaction between the two improved later on. In case of Foundation of Education and Development (FED) that was looking to contain immediate impact of drought in Baran district of Rajasthan during 2002–03, the Trust suggested that FED could benefit from working with ICRISAT scientists. Consortiums by nature throw up several such unexpected outcomes and it does require greater sensitivity by research and coalition partners to document these for they often get missed out in annual reports.

Greater Reflection Possibilities on Processes and Collective Appraisal of Relationships

This institutional history has sought to bring out the institutional elements by reflecting on the processes and appraisal of relationships. In this exercise, simple actor oriented tools have been quite useful for mapping relations between project partners so as to identify and strengthen weak linkages between partners. Also the actor-oriented tools would also enable project team to identify and include potential partners who are not part of the project consortium so as to enable effective project performance. Using actor-oriented tools for analyzing partnerships in the current project, we have realized that they have the potential to improve performance of projects operating in coalition mode and also enable reflective thinking about partners. If such exercises such as using actor oriented tools for mapping strength and weakness of interaction between partners are undertaken by project partners at regular intervals they would be able to strengthen the coalition and also enhance project performance.

This study has inbuilt limitations. Information on institutional aspects of projects in coalitions, we realise, are not easily accessed. They are often not documented and written reports provide little information. While interviews and participation in partners meet have been most useful in deriving lessons we feel that there requires a greater sensitivity to institutional issues from research managers. We have chosen some tools, which we believe, can be useful to draw out these lessons.

However what might be more useful from an ILAC point of view is to evolve ways by which these are appraised collectively by projects with assistance from experts working on institutional issues. We believe that the process of filling up boxes in the ALM or input output tables will get partners to reflect more consciously on institutional arrangements and also push the project into thinking why some relations are desirable, like the link with *panchayati raj* institutions, and what should each partner do to strengthen these as the case maybe. An important feature of consortia is the diversity of partners each with their own spheres of influence and action. Actor oriented tools can enable bringing out synergies between partners over a period of time where the sum can indeed be more than the parts. A conscious and structured reflection of projects can bring this and this report indicates one such way by which international research centres can bring about institutional change. This report does not provide the answers for the project at ICRISAT but suggests the kind of questions and ways that might enable collective search for answers.

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Individuals Interviewed for the Study

ICRISAT

- Dr IR Nagaraj, Director, Human Resources and Operations
- Dr SP Wani, Principal Scientist (Watersheds) and Regional Theme Coordinator, GT– Agroecosystems
- Mr Prabhakar Pathak, Principal Scientist (Soil and Water Management), GT – Agroecosystems
- Dr TJ Rego, Principal Scientist (Soil Sciences), GT – Agroecosystems
- Dr A Ramakrishna, Senior Scientist (Agronomy), GT – Agroecosystems
- Dr GV Ranga Rao, Special Project Scientist (IPM), GT – Agroecosystems
- Ms TK Sreedevi, Scientist (Watershed Development), GT – Agroecosystems

Sir Dorabji Tata Trust

- Mr Mukund Gorakshkar, Program Officer, Sir Dorabji Tata Trust (SDTT), Mumbai at the time of the interview

ICRISAT Team in the Field

- Dr Satishchandra Jadhao, Visiting Scientist from ICRISAT stationed in Guna at the time of interview
- Mr Jitendra Geddam, Consultant, ICRISAT, Bundi district in Rajasthan
- Mr Sangaiah, Technician from ICRISAT on field

Bharatiya Agro-Industries Foundation (BAIF)

Madhya Pradesh

Bhopal Office

- Dr Somnath Roy, Chief Program Officer, Bhopal
- Mr P Seshagiri Rao, Regional Program Coordinator, Bhopal

Guna District

- Mr Santosh Kumar Dixit, Program Manager at Lalatora
- Mr DP Gupta, Field Officer at Lalatora

Bamori

- Mr Sharma, Field Officer at Bamori

Rajasthan

Bundi District

- Dr AK Chaurasia

Samaj Pragati Sahayog (SPS), Bagli, Madhya Pradesh (Dewas district)

- Dr Debasis Banerji, In-charge of the Crop Improvement Program of SPS
- Dr Mihir Shah, Secretary, SPS
- Mr Rangu Rao

4. Policy, governance and socio-economic dynamics in changing drylands (DDPA, FAO)
5. Disaster and risk management in drylands (UNU, WMO, DDPA)
6. Dryland hydrology and water management (UNESCO-IHP, UNU, GEF, DDPA, OSS)
7. Viable dryland livelihoods and policy options (UNDP, UNEP, DDPA, FAO)
8. Education and knowledge sharing in drylands (UNESCO, UNU, DDPA)

Dryland scientists around the world will be joining in Tunis for this major event. Those who do will experience not only a stimulating conference, but also a pleasant and interesting environment.

- Mr Deven Patel, Program Officer, Crop Improvement Program, SPS

Bharatiya Agro Industries Foundation (BAIF), College of Agriculture, Indore affiliated to Jawaharlal Nehru Krishi Viswa Vidyalaya

- Dr RA Sharma, Chief Scientist, Soil and Water Conservation
- Dr Deepak Ranade, Senior Scientist, Soil and Water Conservation

Central Research Institute for Dryland Agriculture (CRIDA), Hyderabad

- Dr YS Ramakrishna, Director, CRIDA
- Dr Sreenath Dixit, Senior Scientist, Agricultural Extension – on secondment to ICRISAT as Project Manager to Virtual Academy for Semi-Arid Tropics (VASAT) at the time of interview.

Annexure I

Time Line of the Tata-ICRISAT Project

Year	Month	Nature of activities undertaken
1998		Visit by team from Sir Dorabji Tata Trust to discuss possibility of a project
2001	Jul–Aug	Dr Wani contacted funding agency – revival of contacts Mr Gorakshkar, Program Officer visited ICRISAT and made presentation
	13 Nov	Project proposal from Dr Wani to Sir Dorabji Tata Trust (SDTT)
2002	4 Mar	Approval Letter from Sir Dorabji Tata Trust to ICRISAT
	8 Mar	Signing of the memoranda of understanding (MoU) Project Steering Committee being constituted Constitution of multi-disciplinary team with members of consortium
	26–27 Mar	Project Launching and Planning workshop held at ICRISAT for appraising partners about the project activities and develop detailed work plans
	25 Apr	Decision taken that the NGO partners will identify the potential benchmarks and communicate it to the project leader
	15 May	Team of consortium partners to visit potential benchmark sites and finalize them Proposal to initiate/start work in benchmark watershed sites during rainy season Work commenced in *kharif* season of 2002 in three villages
	May	BAIF and SPS conducted baseline survey to identify constraints in each district
	20 Jun	Project in Madhya Pradesh was launched at Indian Institute of Soil Sciences, Bhopal
	26 Jul	Project launching workshop in Rajasthan was held at Hari Charan Mathur – Rajasthan Institute of Public Administration (HCM – RIPA), Jaipur
	6 Sep	Awareness camp for farmers regarding importance of soybean in diet held at Central Institute of Agricultural Engineering, Bhopal
	18 Sep	Farmers' Day organized by BAIF at Kailashpura watershed in Guna
	24–26 Sep	ICRISAT-ICAR Farmers' Day at Bhopal organized
	21 Nov	First meeting of the Project Steering Committee held at ICRISAT Soil testing laboratory established at Samaj Pragati Sahayog in Bagli Demonstration of bullock drawn tropicultors during *kharif* season
2003		13 villages covered in the project during second year Constitution of the state level and district level coordination committees
	24 Jan	Farmers' day organized at Badodakalan in Guna district – 300 farmers participated Farmers' day organized in Bundi district – 450 farmers participated
	29–30 Apr	Annual Review and Planning Meeting held at ICRISAT to review progress at individual sites and detailed work plan for 2003 prepared
	19–20 May	Meeting of officials from line department from headquarters at site
	27–29 May	Training workshop conducted for project staff in Bundi and Guna districts regarding collection of household information by Dr Ram Kumar from ICRISAT

Continued.....

Year	Month	Nature of activities undertaken
	12 Aug	Signing of contract between ICRISAT and ISEC, Bangalore
	End of Aug	Participatory Biodiversity exercise conducted in Bundi district
	27 Sep	State level Coordination Committee meeting for Bundi district held at Jaipur
	1 Oct	State level farmers' day held at Goverdhanpura in Bundi district
		Bullock drawn tropicultors used in Guna and Bundi districts to sow crops in *kharif*
		Manufacturer of tropicultor organized a training in Dewas to solve farmers' problems
		27 farmers from Guna district evaluated improved varieties of chickpea and wheat
		Village seed banks provided breeders' seeds for various crops
		Introduction of short duration pigeonpea varieties in five districts of eastern Rajasthan
		Pilot study of safflower carried out in Bundi
		Field bunding, planting on contours, opening of dead furrows and BBF undertaken as part of measures for soil and water conservation.
		In Dewas, 3000 m long field bunding was undertaken
2004	28 Jan	Second meeting of the Project Review Committee at ICRISAT
	26–28 Feb	Visit by Dr Wani to SDTT office in Mumbai to brief Mr S N Batliwalla and Mr Mukund Gorakshkar about progress of project
	2 Mar	Farmers' day organized in Guna district by BAIF – 300 farmers participated
	21–23 Apr	Project Review and Planning Meeting held at ICRISAT
	3–19 Jun	Mr Prabhakar Pathak's visit to Bundi in Rajasthan, Vidisha and IISS, Bhopal to discuss work plan for 2004 with the BAIF staff
	5 Jun	He also visited Goverdhanpura and other watersheds along with BAIF staff and attended farmers' meeting in the village
	15 Jun	Visited Lalatora watershed along with Mr Somnath Roy and activities for *rabi* were discussed with Mr Santosh Kumar Dixit.
	17 Jun	Visited on station watershed at IISS, Bhopal along with Dr Misra and other IISS scientists where technical help of ICRISAT scientists was sought
	14–15 Jun	Dr Wani's visit to Institute of Social and Economic Change (ISEC), Bangalore to attend work plan seminar of Ph D fellow sponsored by ICRISAT
	1–15 Sep	Visit by Ph.D student from ISEC for data collection for her study on 'impact of subsidies on groundwater availability' funded through the project
	19–20 Oct	Training programs in Guna district to generate awareness among farmers in project area towards improved seeds, fertilizers, organic farming, etc.

Continued.....

Year	Month	Nature of activities undertaken
	19 Oct	Animal Health camp at Thuniyakundal in which 71 animals were treated
	21 Oct	Animal Health Camp at Sangrampura in which 47 animals were treated 23 improved crop varieties being used by farmers in the project villages Fruit tree plantation taken up in *rabi* 2003 and *kharif* 2004 Farm bunding taken up in the fields of 32 farmers in Dewas district 31 farmers take up plantation of horticultural plants in Dewas district Drip irrigation introduced in the project villages in Dewas
2005	Mid-Feb	Data Collection for impact assessment surveys in Bundi and Guna districts
	8 Mar	Farmers' day organized by BAIF at Kailashpura in Bundi district
	22–23 Mar	Annual Partners meet at ICRISAT to review project progress and finalize future plan
	24 Mar	PAC/Tata Steering Committee meeting held at ICRISAT

Annexure II

Results of Evaluation of Varieties by Samaj Pragati Sahayog

Crpo	Variety	Positive features	Negative features	Results
Sorghum	JJ 1041	Good grain size, fodder quality, good market price, resistant to *Striga*	Long duration, Prone to pests, Susceptible to lodging	Accepted
	JJ 1022	Short duration, good grain size, resistant to *Striga*	Susceptible to mould and lodging	Accepted
	CSV 15	Good grain, fodder quality, resistant to Striga	Susceptible to lodging	Accepted
	JJ 741	Good grain size, fodder quality, resistant to *Striga*	Medium to long duration, susceptible to lodging	Accepted
Maize	JM 8	Short duration, medium height, good fodder quality	White grain colour, low yields	Not accepted
	JM 12	Medium duration, better grain appearance, good fodder quality	Poor performance on lighter soils, unsuitable for intercropping with cotton	Not accepted
	JM 216	Good fodder quality, high yield, better market price	Long duration, tall	Accepted
Pigeonpea	ICPL 87119	Good grain appearance, wilt and pest resistance, moderate yield	Long duration, not suitable for lighter soils	Accepted
	ICPL 88039	Medium/short duration, wilt and pest resistance, adaptability to lighter soils, high acceptability in region	-	Accepted
	JKM 7	Good grain appearance, wilt and pest resistant, high yielding	Long duration, unsuitable for lighter soils	Not accepted
	JA 4	High yielding, bold grain, good market price, wilt and pest resistant	Long duration, unsuitable for lighter soils	Not accepted
Groundnut	ICGS 76	Good grain appearance, pest resistant, high yielding	Long duration, needs watering to be uprooted	Not accepted
Pearl Millet	ICMV 221	Ultra short duration, suitable for lighter soils, bold grain, good market price		Accepted
Chickpea	ICCV 2	Short duration, excellent adaptability to lighter soils, wilt resistant	Prone to *Heliothis* does not perform well in lime rich soils	Accepted
	ICCV 10	High yield, pest resistant	Long duration, needs one irrigation for optimal yield	Not accepted
	ICCC 37	Good grain size, higher adaptability to lighter soils, pest and wilt resistant	Long duration, needs one irrigation for optimal yield	Accepted
	KAK 2	Medium duration, good grain size, good market price, wilt resistant	Needs heavy soils, prone to pest attack, requires irrigation	Acceptable for farmers with water

Source: Presentation by SPS at the partners' meet held during March 2005.

Annexure III

Input Output Tables for Guna, Bundi and Dewas Districts

Guna District

Input and Output table for Guna district indicates that in implementing field level activities, BAIF interacts with many organizations like ICRISAT, IISS, SPS and various line departments of Madhya Pradesh government along with farmers. For capacity building and providing training to farmers during field days, officials from department of agriculture, department of animal husbandry participate in farmers' days organized through the project and provide information regarding the various schemes undertaken by the government.

Input and output table for Guna district

Agency	What does it provide BAIF	What does it get from BAIF
ICRISAT	Improved seed varieties; Automatic weather station; Run off recorder; Tropicultor; Simulation models for potential yields for different crops; Micro nutrient trials	Information from baseline surveys (social and economic profile of area); Research data as reports based on performance of varieties in farmers' fields
SDTT	Financial resources and networking with agencies working at the field level	BAIF's expertise in livestock development utilized in other SDTT projects
JNKVV	BAIF takes inputs from Horticultural Research Institute, Bhopal affiliated to JNKVV for training programs for farmers, exposure visits and so on	
CRIDA	No direct interaction between the two organizations but assisting in networking through dry land centers	
NRSA	Image and Base map of Guna; Slope map; Water harvesting structures and well location map to assess impact across time	Not applicable
GoMP	Policy level issues in terms of guidelines; capacity building for farmers and project staff by government departments	Development projects implemented suitably
SPS	Feedback of livestock program in poor market areas	Establishment of AI Centre and technical support for running the Centre
FPVs	Land and other necessary inputs to undertake cultivation of varieties; Feedback on performance	Improved varieties; exposure visits, training programs and farmers' days
IISS	Organizing Exposure visits, training programs and participate in farmers' days	Partnerships for field days and networking

In Guna district, BAIF receives financial resources from the Trust through ICRISAT for implementing the project activities at field level; independent of this, the Trust has been working with BAIF in projects related to livestock development in the country. In Guna district, the input and output table provides an interesting picture wherein the line departments of Madhya Pradesh government have an important role in undertaking capacity building activities for the farmers and also the NGO staff. In addition to this the table also indicates that the project staff from BAIF have close interaction with scientists from the Indian Institute of Soil Science (IISS), Bhopal, which providing technical know how and also enable capacity building for farmers in three project districts.

Bundi District

The below table indicates diversity of actors that BAIF interacts with and in Bundi district in eastern Rajasthan. In contrast to two districts in Madhya Pradesh, line departments (i.e., department of agriculture, animal husbandry and department of soil and water conservation) have an important role in project activities indicating an active participation from the state government.

Input output table for Bundi district

Agency	What does it provide BAIF	What does it get from BAIF
ICRISAT	Improved varieties of seeds; Automatic weather station and run off recorder; Simulation models for potential yields for different crops; Micro nutrient trials; tropicultor; information dissemination	Information from base line surveys Feedback from the farmers regarding performance of seeds and technologies
SDTT	Financial resources and networking with agencies working in field	BAIF's expertise in livestock utilized in other projects
MPUAT	Technical inputs and exposure visits and training programs	Feedback from farmers on various introduced varieties
KVK, MPUAT	Capacity building to BAIF staff and farmers; technical inputs to farmers in terms of IPM in *kisan melas* and statistical data for soil analysis.	Interaction between KVK staff and ICRISAT enabled and mediated through BAIF
IISS	Provision of inputs in terms of developing bench mark watersheds, exposure visits of farmers; soil testing taken up	Not applicable
CAZRI	Inputs for coordinating silvipasture development, biodiversity studies and training for farmers	Not applicable
NBSS & LUP	Involved in conducting soil surveys	Not applicable
CRIDA	Planning and interactions during review meetings, inputs provided for agroforestry in initial stages	Not applicable
NRSA	Base map and slope map; Land cover map; Water harvesting and well location map; Hydro geomorphology map; Drainage map	Not applicable
GoR Depts.	Primary health department – medicines provided to primary medical centre through ancillary nurse/midwife (ANM); agriculture department – training farmers in improved agricultural practices;	Not applicable
DSWC	Expertise in livestock development	Expertise in watershed development
FPVs	Land and other necessary inputs to undertake cultivation of varieties	Improved varieties of seeds; capacity development through farmers' days, exposure visits and training programs
SHGs	Revolving fund for washing power production unit and primary medical centre	

Dewas district

The input output table for Dewas district lists important actors with whom SPS interacts on a regular basis. Through the project, farmers in project villages receive inputs in terms of improved varieties of chickpea, pigeonpea, and groundnut, multipurpose tropicultor and also micro-nutrient trials.

Input output table for Dewas district

Agency	What does it provide SPS	What does it get from SPS
ICRISAT	Improved seed varieties; Automatic weather station; Run off recorder; Soil testing laboratory; Tropicultor; Simulation models for potential yields for different crops; Micro nu]trient trials	Information from baseline surveys; Critical feedback and data as reports based on performance of varieties in demonstration plot as well as farmers' fields; foregrounding of issues of equity and sustainability in NRM
SDTT	Financial resources; Networking with agencies working at field level and IARCs; Linkage with ICRISAT; facilitation for raising concerns of civil society; Possible platform for advocacy of regional issues in NRM	Networking with other NGOs working in areas where SPS has been working; Provide inputs to raise social science questions while working with IARCs
JNKVV	Improved soil and water conservation measures; Improved varieties of Sorghum, Maize, and Soybean;	Not clear
NRSA	SPS got maps done from NRSA during 1993 and 1998 before current project	Not applicable
CRIDA	No direct interaction between these two organizations	
GoMP	Criticism and protests on new guidelines by excluding NGOs	
BAIF	Establishment of Artificial Insemination centre	Training in watershed development; Feedback of livestock program in poor market areas
IISS	No direct interaction despite being in same state and also being involved in similar activities	
FPVS	Land and other necessary inputs for cultivation of varieties; Feedback on performance of varieties and tropicultor	Improved varieties of seeds of chickpea, pigeonpea, soybean from different sources
PRI	Invitation to SPS for working at village level	Wide ranging expertise in different spheres of activity such as agriculture, watershed, and, exposure visits for farmers
SHGs	Income generation activities; Village seed banks; Vermicomposting and NADEP	

The interesting aspect of work done by SPS is that it evaluates technological package (be it improved seeds, equipment or micro nutrient trials) in the demonstration plot before handing it over to farmers. If successful in the project villages, SPS introduces these technologies to other villages not covered by the project. From the above table, it is also evident that the project-implementing agency interacts closely with the *panchayati raj* institutions at village level; SPS insists on receiving an invitation from the village *panchayat* to work in a particular village. After the village *panchayat* formally invites SPS to work in their village, they go to the village and do a survey to get a feel of the situation at the field level after which activities are taken up.

Annexure IV

Actor Linkage Matrix for the Tata-ICRISAT Project

Actor	ICRISAT	SDTT	JNKVV	IISS	MPUAT	CRIDA	NRSA	SPS	BAIF	GoMP	GoR	Farmers	SHGs	CAZRI	NBSS & LUP	ISEC	Sewa Mandir	Acronyms
ICRISAT		S	S	S	S	S	S	M	S	M	S	W	W	S	S	M		International Crops Research Institute for Semi Arid-Tropics
SDTT	S		W		W			S	M								S	Sir Dorabji Tata Trust
JNKVV	S	W						M		M		M	M					Jawaharlal Nehru Krishi Viswa Vidyalaya
IISS	S	W			S	M	M		S	M								Indian Institute of Soil Science
MPUAT	M								S		M	M	M	S	S			Maharana Pratap University of Agriculture and Technology
CRIDA	M													M	M			Central Research Institute for Dryland Agriculture
NRSA	M								S									National Remote Sensing Agency
SPS	W	S	S						M	W		S	S					Samaj Pragati Sahayog
BAIF	S	M		S	M	M	M	M		M	M	M	M	M	M			Bharatiya Agro Industries Foundation
GoMP	W		W	W				W	W			W	W					Government of Madhya Pradesh
GoR	M				W				W			W	W					Government of Rajasthan
Farmers	W		W	W	W			S	S	W	W		M					Farmers
SHGs	W																	Self Help Groups
CAZRI	M					M			M		W							Central Arid Zone Research Institute
NBSS & LUP	M					M			M		W							National Bureau for Soil Survey and Land Use Planning
ISEC	M																	Institute for Social and Economic Change
Sewa Mandir		M																Sewa Mandir

Colour	Meaning	Code	Meaning
White	No information available / Not relevant	S	Strong Linkage
Pink	Linkage got initiated through the current project	M	Medium Linkage
Orange	Linkage existed prior to project	W	Weak Linkage
Light blue	Linkage existed independent of the current initiative		

Annexure V

Actor Linkage Matrix for the Dewas District

Actor	SPS	SDTT	ICRISAT	JNKVV	IISS	CRIDA	NRSA	BAIF	GoMP	DoA	DoAH	PRI	Forest dept	FPVs	FOVs	SHGs	ICAR institutes
SPS		S	M	M				M	M	W	W	S	M	S	S	S	S
SDTT	S		S	M				M									
ICRISAT	M	S		S	S	S	S	S	M					W	W	W	M
JNKVV	M		S						M	M				M	M	M	S
IISS																	
CRIDA			S		M			M									
NRSA																	
BAIF	W		S		S				M	M	M						
GoMP	M		W	M	M			M		S							
DoA	W			M	M			W	S								
DoAH	M							M	S	S							
PRI	S								M	M							
Forest dept	M								S	S							
FPVs	S		W	M					W	W	W	M	M		S	S	
FOVs	S		W	M					W	W	W		M	S		S	
SHGs	S		W	M					W	W	W	M	M	M	M		
ICAR institute	S		M	S	M												

Colour	Meaning	Code	Linkage
White	No information available / Not relevant	S	Strong Linkage
Pink	Linkage got initiated through the current project	M	Medium Linkage
Orange	Linkage existed prior to project	W	Weak Linkage
Light blue	Linkage existed independent of the current initiative		

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Annexure VI

Actor Linkage Matrix for the Dewas District

Actor	BAIF	SDTT	ICRISAT	JNKVV	IISS	CRIDA	SPS	GoMP	DoA	DoAH	FPVs	FOVs	SHGs
BAIF		M	S	S	S	M		M	M	M	S	S	S
SDTT	M		S	M			S						
ICRISAT	S	S		S	S	S	M	M	W	W	W	W	W
JNKVV			M				S	M	M		M	M	M
IISS	S		S			W							
CRIDA			S		W								
NRSA			S		W	M							
SPS	W	S	M	S				M					
GoMP	W		W	M	M		W		S	S	W	W	W
DoA	M			W	W		M	S		S	W	W	W
DoAH	M												
FPVs	M		W		W			W	M	M		M	W
FOVs	M		W		W			W	W	W	S		W
SHGs	M		W		W			W	W	W	M		

	No information available/Not relevant	S	Strong Linkage
	Linkage got initiated through the current project	M	Medium Linkage
	Linkage existed prior to project	W	Weak Linkage
	Linkage existed independent of the current initiative		