

**Applying Innovation System Principles to Fodder Scarcity:
Experiences from
the Fodder Innovation Project**



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List of Abbreviations

CRISP	Centre for Research on Innovation and Science Policy
FES	Foundation for Ecological Security
FIP	Fodder Innovation Project
FIPWiG	Fodder Innovation Policy Working Group
KPO	Key Partner Organization
IC	Innovation Coordinator
ICAR	Indian Council for Agricultural Research
ILRI	International Livestock Research Institute
JDPC	Justice Development and Peace Commission
KNARADA	Kano Agricultural and Rural Development Authority
M&E	Monitoring and Evaluation
M&L	Monitoring and Learning
NARS	National Agricultural Research System
NDDB	National Dairy Development Group
NGO	Non Governmental Organization
RMG	Research Management Group
UNU-MERIT	United Nations University-Maastricht Economic Research Institute for Technologies
WOTR	Watershed Organization Trust

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Abstract

This paper is a reflection on a research project that defied the conventional technology transfer approach and adopted an approach based on innovation system principles to address fodder scarcity. Fodder scarcity in the project was conceptualized not as lack of technical capacity, but as lack of innovation capacity. This project tried to enhance innovation capacity by promoting appropriate configurations of stakeholders. However, translating this theory and principles into action was fraught with numerous challenges. In the absence of previously documented experiences, the project course was determined based on continuous and concurrent review and lesson learning. A first-hand account of the project implementation is presented in this paper so that it benefits others who are experimenting with similar approaches.

Applying Innovation System Principles to Fodder Scarcity: Experiences from the Fodder Innovation Project

1. INTRODUCTION

In recent years a renewed interest in innovation has sparked the use of the innovation system perspective as a diagnostic and planning tool in agriculture programs the world over (World Bank, 2006). This has been a marked shift from a policy focus in the past that largely promoted agricultural innovation through investments in public agricultural research and extension organizations (Hall, 2007). Despite a number of prominent successes, however, — notably in spreading the use of seed-based, high-yielding technologies in Asia — research and extension organisations have come under criticism for their modest impact on both agricultural development and associated socio-economic conditions (Sulaiman and Hall, 2002).

The contemporary understanding of innovation— as neither research nor invention but as a social process of learning and acquiring knowledge and putting it into socially and economically productive use —offers new insights into ways of accelerating agricultural development. This perspective shifts policy attention to a much broader arena of activities, processes and capacities involved in innovation, and highlight the need for a new set of interventions to complement investments in agricultural research and extension (Reddy et al., 2012).

This new understanding is reflected in new projects and initiatives that are trying to build evidence for providing proof of the concept while showcasing the rationale for using innovation systems approaches in agriculture and rural development (Hall et al., 2010). However, several of these initiatives are ongoing and lesson learning is at a nascent stage; hence there in spite of elaborate theories of innovation systems, there are few attempts to provide practical road-maps that translate the related principles into practice (Ergano et al., 2010). As a result planning and implementing innovation systems-based initiatives continue to remain a challenge. This is compounded by a dearth of significant and systematic documentation of experiences of such initiatives.

This paper attempts to bridge this crucial knowledge gap by presenting experiences gained from implementing the second phase of the Fodder Innovation Project. The project, implemented jointly by the International Livestock Research Institute (ILRI) and the United Nations University-Maastricht Economic and social Research and training centre on Innovation and Technology (UNU-MERIT), explored ways of building the innovation capacity of livestock systems in order to address fodder scarcity. The paper is presented as a self-reflection by the project implementation team on the challenges faced and how these were addressed.

2. FODDER SCARCITY IN INDIA AND NIGERIA: ADDRESSING THE PROBLEM

2.1 Context

The lack of availability and access to quality fodder resources is an important constraint in livestock production. Fodder and water shortages are increasingly recurring phenomena, not only in arid and rain-fed regions, but also in irrigated areas and regions receiving higher rainfall. A policy push toward more productive but input-intensive breeds has also increased the demand for more fodder. At the same time, the shrinking of common property resources (as a result of industrial use, plantations etc.) and the deterioration in their quality has reduced the availability of grazing lands. Livestock producers meet their fodder requirements through a combination of crop residues and grazing on common lands, private lands, forests, fallow agricultural lands and harvested agricultural lands. Fodder requirements are also met through cultivated forage crops (cultivated mostly by large landholders), while some producers purchase this fodder.

Traditional approaches to addressing feed and fodder scarcity revolved around evaluating various forage crops (grasses, shrubs, trees) for their yield, nutritional content and impact on livestock production parameters (e.g., milk yield, live weight gain etc.), and then disseminating this knowledge as fodder technology (usually embodied as seed of improved varieties and their management and use) through animal husbandry departments and dairy development agencies. National and regional governments often set up fodder seed production farms to support the production and availability of these improved seeds. These farms also served as demonstration and training units for fodder promotion.

Given that the fodder scarcity problem was understood as an issue of lack of availability of quality fodder seed, approaches to tackling the problem focused on: developing improved varieties of fodder crops through research; multiplying them in fodder seed farms; distributing them along with information on their benefits and use (extension). The key assumption, thus, was that lack of technology was the key constraint and that research could address this problem.

2.2 About the FIP Project

The DFID-funded Fodder Innovation Project entitled “Enhancing livelihoods of poor livestock keepers through increasing use of fodder”, was implemented by ILRI in India and Nigeria, in collaboration with several national and international research and development partners. It was originally conceived as a six-year project with two three-year phases.

The first phase of the project (2003-06) framed the problem of fodder scarcity as one of technical and information scarcity on fodder production. Its central approach involved identifying and disseminating new varieties of fodder or dual-purpose crops aimed at increasing fodder supply. This involved participatory selection of fodder options with an emphasis on genetically improved germplasm and new planting designs. The project team believed that the fodder production technologies selected by the farmers during participatory selection trials would diffuse to large numbers of producers through farmer-to-farmer exchanges and dissemination activities conducted by the project's development partners (FIP I, 2006).

However, at this early stage it became clear to the project implementers that the approach — which broadly involved technology transfer — was not likely to facilitate changes that would lead to a reduction in fodder scarcity. It also became apparent that technical change was going to need the co-operation of several other actors concerned with the livestock sector and that this, rather than the technical robustness of particular fodder varieties, would determine success (Hall et al., 2007).

Lessons learned from the first phase of the project helped to reshape the design of the second phase, which ran from 2007 to 2010, with ILRI bringing in UNU-MERIT as a partner for the latter's experience with working on agricultural innovation systems. This new phase redefined fodder scarcity in terms of a lack of capacity of the livestock system to innovate and not as scarcity of technology. It also expanded on the problem as stemming from a lack of coordination and coherence among different actors, processes and policies in the livestock sector — essential to bringing about necessary technological, institutional and policy changes to meet the demands of a dynamic environment. In line with popular debates on the agricultural innovation process, the project, thus, hypothesized that the fodder scarcity problem could be tackled through the creation of networks with appropriate actor configurations, building a common cause and facilitating new working relationships (Hall et al., 2007).

The project then set out to investigate the nature of the groupings and networks of individuals and organizations and the factors that affected their ability to work in a systemic, coherent way in order to bring fodder-related knowledge and services into productive use. It also explored policies and practices that mobilised ideas and information in ways to strengthen the capacity of the system.

These changes in the project's conceptualization resulted in a fundamentally different approach in the second phase. The purpose of this paper is to share experiences of this approach.

From here on this paper is organized as follows: the next section presents the implementation design of the project. The challenges faced and experiences gained from implementing such a project are discussed in Section 4. Conclusions and lessons for policy and practice are presented in Section 5.

3. IMPLEMENTATION OF THE FODDER INNOVATION PROJECT: PHASE 2

This section describes the project design of the second phase of the Fodder Innovation Project, which attempted to apply innovation system principles to address fodder scarcity. For the convenience of presentation, these details are presented in two phases: the preparatory phase and the implementation phase. However, it needs to be noted that such a distinction was not articulated either in the project proposal or during the project implementation.

3.1 The preparatory phase

Given the significant departure in conceptualization from its first phase, the project undertook a series of preparatory activities before initiating activities in the field.

Developing a conceptual framework

At the start, project leaders felt that the scope of the new approach in phase 2, and its conceptual underpinnings, needed to be clarified and made explicit. They addressed this by developing a conceptual framework that explained the innovation system framework in agriculture and rural development, its merits and challenges, as well as ways of adopting it. The framework also presented the idea of fodder innovation capacity and ways of strengthening it, with a discussion of tools to be used for the diagnosis of institutional change along with the research hypothesis of the project (Hall et al., 2007). This document served to inform all personnel and partners about the direction of the project and its rationale. It also served as a key communication tool for various audiences (donor, project teams, partners, other researchers, policymakers, etc.).

Building the project team

During the first phase the roles carried out by the Project Manager (an animal science professional with experience in project management) included: implementation, coordination and monitoring of a pre-determined set of activities. These activities — carried out by partner organizations that were subcontracted by the project — involved an assessment of the demand for fodder and the testing and dissemination of fodder technologies. In the second phase the focus of these activities shifted to exploring ways of building innovation capacity, which required different sets of skills to manage an evolving set of activities (Table 1).

Table 1. The Project Management Structure in FIP

	Thematic Leadership Role	Project Management Role
Phase I	Animal and crop science-oriented — Identification, testing and dissemination of fodder technologies	Conventional agriculture research project management, involving implementing and monitoring of pre-determined action plans
Phase 2	Social science-oriented — Innovation Systems conceptualisation	Flexible to accommodate evolving activities, providing enabling environment (facilitation, communication, logistics, monitoring fund flow, etc.)

Source: Authors

The second phase of the project had no predetermined interventions or sets of activities. Instead, these evolved as the project progressed and were driven by the experiences of partner organizations and the sets of activities they found useful in the process of exploring how to develop innovation capacity. Given the modalities of the action research employed, it was necessary for the Project Manager to engage with partners and stakeholders in an intensive and elaborate way. This required strong facilitation skills. Ensuring continuous and extensive communication among all the partners and collaborators was critical and an

appropriate communication strategy was considered necessary. The evolving nature of the project needed flexible and nimble management to accommodate continuous changes, requiring abilities to identify and meet changing needs and demands. This need for a broader range of project management skills provided challenging to the more conventionally-orientated Project Manager.

The second phase of the project was launched largely with the same project management structure that was in place in the first phase. However, some new professional skill sets were recruited for example, innovation system researchers, field managers and innovation coordinators to undertake different roles and responsibilities. As new requirements became apparent, the team adjusted itself to play these roles. Constant review, discussions and 'long and hard' negotiations among team members helped in reorientation of the team members' roles. As a result the following non-hierarchical management structure evolved.

- Project management team consisting of the Project Manager and field managers
- Research team consisting of the Research Manager/ thematic leader and researchers

Establishing partnerships

Both the phases of the project depended on research and development partnerships. However, they differed in the modalities of engagement. The key research partners in the first phase were mostly scientific organizations that brought with them fodder-related technical knowledge and were sub-contracted to conduct specific components of the project. These organizations were responsible for implementing pre-determined research activities, submitting reports and representing the project in meetings and conferences. In the second phase, the key research partners were experts in innovation and science policy; they took on the thematic leadership role and participated in strategic decision-making.

The field-level implementing partners in the first phase were chosen for a potential role in transferring technologies. They were responsible for implementing pre-determined activities in the field and participated in data collection for the project. In the second phase, preference was given to organizations that appreciated the new approach and were willing to engage with the project in identifying and putting together a configuration of relevant actors that could enhance capacities for addressing the fodder scarcity problem.

The project adopted an explicit, two-stage process to select appropriate partners. In the first stage, an extensive "Partner Landscaping Study" was undertaken in India and Nigeria to screen organizations associated with the livestock sector for their suitability in partnering with the project (See Box 1 for the criteria used). Two local independent researchers from India and Nigeria were employed to undertake this study in each country. The process involved a literature review, discussions with sector experts and key informants, and meetings with the shortlisted organizations. Selected organizations were contacted to gauge their interest in partnering with the project. Based on their interest they were considered for the second stage.

In the second stage, the short-listed organizations were invited for a "Partner Leveling Workshop"— the term leveling was used to indicate that the aim of the workshop was to establish a similar level of understanding about the project and its approach. In the workshop the project approach and its conceptual underpinnings were discussed to help participants decide whether their organizations would be willing to partner with such a project. This workshop also helped the project team understand the organizations and their activities better. After this stage, the partners were finalized through a combination of self-selection and choice by the project team. Some organizations chose not to become partners. The project also ruled out some organizations at this stage as potential partners.

Box 1. Criteria used to select partners during the 'Partner Landscaping Study'

First order criteria

- History or interest in working on fodder-related issues
- Sympathy to the approach (evident through: the recognition that innovation goes beyond technology transfer; willingness to try new approaches; evidence and history of institutional innovation in programming and approaches; action research and process documentation experience; evidence of being a learning organisation or have a learning culture; and, evidence of a history of partnering with a diversity of organisations/ or being part of/ or coordinating relevant networks)
- Diversity of partners to include different organisational types (public/private/NGO); different livestock systems in which they are working; and, different degrees of market integration (across a spectrum from commercial to subsistence)
- Poverty and equity relevance of agenda and activities. This did not mean that the organisations had to work mainly or exclusively with poor livestock keepers, or with particular social groups such as women or tribal communities. Rather, this criterion was used to determine if the agenda or activities of organisations related to the wider livelihoods of the poor through livestock enterprises, employment, or selling fodder or livestock-related services.

Second order criteria

- Scale and links to policy relating to the scope of an organisation's activities and the potential for diffusing outcomes in this domain and exploiting opportunities for scaling up through wider policy and institutional change
- Social science expertise involving analytical skills, process documentation and lesson learning

Source: Authors

The selected partners —referred to hereafter as the Key Partner Organizations (KPOs) — were encouraged to decide, plan and implement activities that could result in building innovation capacity around fodder-livestock issues in their respective locations. They were given adequate flexibility in the utilization of project resources and in time. The partnership agreement between the project and the KPOs reflected these essential components.

Recruiting the 'Innovation Coordinator'

Each KPO appointed an 'innovation coordinator', who would be responsible for implementing activities in the field. The selected candidates were exposed to the project's conceptual underpinnings during an 'induction workshop' (see Box 2), which used real-world cases of agricultural innovation. FIP also provided the coordinators with several opportunities to reflect on their roles in order to help them analyse and orient their activities in the field. Though the role of the innovation coordinator was clear, specific activities could not be defined at the beginning. The coordinators played a key role in building networks of relevant agencies. To perform this role effectively, they needed to be familiar with diverse stakeholders, share a rapport with them and, more importantly, have the skills to devise strategies to build these networks. The KPOs adopted different approaches in appointing these coordinators and this diversity provided a learning opportunity for the project team.

Identifying interventions and designing activities

Identifying specific interventions and activities for each of the project locations was a major challenge. Each of the project locations was distinctive with respect to its context and the nature of fodder scarcity. In order to capture such uniqueness and devise intervention activities, the project team and the innovation coordinators undertook the following steps.

Box 2. Induction Workshop

Innovation coordinators represented the project in the field. They needed to understand and appreciate how the project was conceptualised in order to articulate it while dealing with their respective stakeholders and promoting appropriate interventions. Considering the significance of their role, the project organised an induction workshop for the innovation coordinators at the start. The workshop involved sessions with a combination of theoretical inputs and participatory exercises that were used to familiarise participants with the innovation system concept, its application in agricultural research and development, and its relevance to the project.

The theoretical inputs were provided in a tutorial mode, where participants read through literature involving both concepts and real-world examples. This was followed by plenary discussions around highlighted issues. These sessions were interactive and flexible to allow for exhaustive discussions on issues of interest. In subsequent sessions such as the Rapid Diagnosis exercises (discussed later on in this paper) the intervention themes were identified for each project area. The sessions also explored the project's research questions and ways of addressing them.

Source: Authors

Rapid Diagnosis: The primary aim of these exercises was to identify an intervention theme in each of the project locations. The project organized workshops for stakeholders in each location, during which they were introduced to the project and participated in discussions on livestock-fodder problems in their respective areas. Participants also discussed unique features and sources of the problem, and ways of addressing it. At the end of each workshop, participants prepared a joint intervention plan aimed at addressing the problem. More importantly, these discussions helped achieve a shared understanding of the problem and ways of solving it among diverse stakeholders.

Refining research themes and research questions: Innovation coordinators went on to discuss the intervention themes identified during the Rapid Diagnosis exercises at the induction workshop. These themes were refined and framed to fit the project conceptualization (See Box 3), and the research questions for each theme were identified. These research questions helped the innovation systems researchers understand how field level-activities contributed to fillings gaps in institutional arrangements.

Box 3. Research Themes

- An experiment in establishing an integrated fodder production and marketing system based on farmer fodder entrepreneurs (Puducherry, India)
- An experiment in developing a mechanism to coordinate complementary technical (including fodder) and institutional support in order to upgrade smallholder dairy systems (Rajasthan, India)
- An experiment in developing a mechanism to negotiate improved fodder access in public (wastelands and forest areas) and private grazing areas for poor livestock keepers (Maharashtra, India)
- An experiment in connecting and coordinating existing systems (markets, religious/ethnic groups, technical support, policy and traditional institutions) to facilitate the transition from subsistence to commercial goat production (Oyo, Nigeria)
- An experiment in connecting and coordinating existing systems (markets, religious/ethnic groups, technical support, policy and traditional institutions) in order to address seasonal fodder shortages in mixed crop livestock systems (Kano, Nigeria)

Source: Authors

Developing joint action plans: The induction program helped the innovation coordinators understand how the project was conceptualized. Sessions on framing research themes and questions also provided clarity on the project focus in their respective areas. Given this thorough induction, the innovation coordinators went back to the field where they organized

meetings with their respective stakeholders and shared what they had learned. In conjunction with their stakeholders, and enriched with insights from the induction programme, the coordinators drew up joint work plans based on the intervention plans proposed during the Rapid Diagnosis workshops. Project team members participated in these discussions, but allowed the coordinators to take the lead.

3.2 The Implementation Phase:

The 'preparatory activities' discussed in the previous section set the stage for the next phase of interventions, elaborated below.

Establishing a baseline

Recording starting conditions in the project locations was essential to establishing the changes in innovation capacity and the resulting changes in the fodder-livestock situation and, consequently, socio-economic conditions. The project recorded this through two simultaneous studies — (a) documenting existing socio-economic conditions of communities targeted (socio-economic baseline) and (b) documenting existing innovation capacity of the livestock systems (institutional baseline) in each of the project locations.

Socio-economic baseline: The main objective of the socio-economic baseline was to document existing conditions of livestock/ fodder/ livelihood aspects in the pilot sites. The project collected data through structured questionnaires (of households selected through stratified random sampling) and focus group discussions at the village level. The information collected concerned land and livestock holding, irrigation status, types of livestock held and the nature of livestock production systems, availability and access to dry and green fodder and other feed, seasonality of feed availability and management practices, institutional arrangements and problems and perceptions of respondents related to livestock-based livelihoods. Project officials analyzed the data collected through these surveys and presented the analysis to the Key Partner Organizations (KPOs), with their feedback used in preparing the final reports.

Institutional baseline: The key objective of the institutional baseline was to diagnose and document the existing nature of capacity of the livestock innovation system in the project locations. A 'four-point tool', proposed by the World Bank (2006), was employed to study four components: actors and their roles; their patterns of interaction; habits and practices; and policies, institutions and infrastructure. This tool was used in each project location as a way of capturing innovation capacity status. The project also collected data through a literature review, project site visits, discussion with key informants from each KPO and other stakeholders. This data was analyzed and shared with the KPOs and their feedback was incorporated into the final reports.

Facilitating action learning loops

Project leaders believed that the first step in building innovation capacity involved bringing relevant stakeholders together in a network for concerted action. They expected these networks to have different compositions based on the issue under consideration, with one member taking on the role of facilitator/ coordinator. Therefore, in the initial stages, field activities were largely about identifying relevant actors, understanding their habits and practices and bringing them together in multi-stakeholder networks to jointly plan, implement and monitor activities that were aimed at addressing issues around fodder scarcity. The project did this through action research cycles, with each cycle of planning, execution and evaluation generating lessons for subsequent cycles.

Ensuring communication

Continuous and uninhibited flow of information and feedback was essential in a project like FIP II, where very few activities could be decided upfront and many decisions needed to be

made on the go and based on concurrent learning. The decision making process involved both the researchers (experienced in innovation systems research) and the field implementers (experienced in rural development initiatives), who differed in the nature of their expertise and needed to work in harmony. In addition, the researchers and implementing teams were geographically dispersed. Their specific roles and responsibilities evolved as the project progressed. For many members of the project team this was their first experience in applying innovation system principles in addressing fodder scarcity, while the project's conceptual underpinnings were new to others. Given all these challenges, the project needed to develop a coherent communication strategy — the key elements of which are presented in Table 2 — that would ensure that everyone was on the same page.

Table 2: Key communication modalities employed in FIP II

Communication	Message	Means
Project team with KPOs	<ul style="list-style-type: none"> • Project conceptualization • Progress of project activities • Lessons from the project 	<ul style="list-style-type: none"> • Partner leveling workshop • Induction training for innovation coordinators • Innovation coaching • Quarterly Review Meetings and internal research symposia • Project website • Posters, field visits, email and telephone calls
Project team with external audience	<ul style="list-style-type: none"> • Project conceptualization • Lessons from the project 	<ul style="list-style-type: none"> • Project website¹ • Internal research symposia² • Workshops, publications • Presentations in conferences, posters
Among network partners at KPO locations	<ul style="list-style-type: none"> • Project conceptualization • Progress of activities • Lessons from the project 	<ul style="list-style-type: none"> • Consultative meetings of network partners • Meeting individual stakeholders • Joint field visits; sharing reports
Among the project team members	<ul style="list-style-type: none"> • Project conceptualization • Progress of project activities • Lessons from the project 	<ul style="list-style-type: none"> • Weekly project meetings³ • Research Management Group Meetings • Need-based meetings; write shops • Sharing reports, email and telephone calls

Source: Authors

¹ The project website, developed in consultation with all collaborators, was the key interface of FIP with an external audience. The 'topic of the month' section of the website provided space for project staff and other partners to post their ideas on various issues concerning the project. This was a means of sharing internal thinking and discussions with an external audience.

²Internal Research Symposia: The project organised two workshops — one each in India and Nigeria — and invited representatives from diverse stakeholder organisations to them. Here, they shared progress updates and lessons learnt with the participants and invited feedback.

³FIP institutionalised 'Weekly Project Meetings' to ensure continuous sharing of project management issues among team members based in different offices in India and Nigeria. Team members at the coordinating office location met on a weekly basis to monitor progress and discuss emerging issues and directions. Deliberations in these meetings were documented and reports shared with all concerned. These reports were compiled and uploaded to the project website.

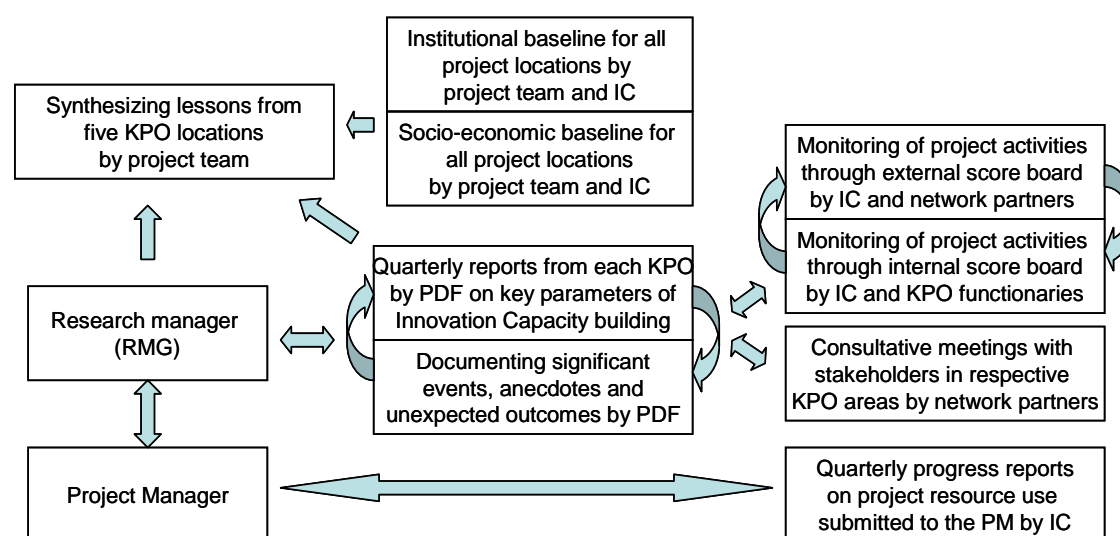
Monitoring and Learning

The learning nature of the project demanded continuous monitoring and reflection at different levels by different people. The project's monitoring and learning (M&L) system aimed to fulfill the following objectives:

- To enable the KPOs and their stakeholders to assess and plan activities, while appreciating their contribution toward building the capacity of the livestock innovation system
To enable researchers to track their progress, as well as identify and synthesise principles and lessons on building the innovation capacity of livestock systems
To support the project manager in monitoring and guiding the use of project resources
- To facilitate setting up plausible causal connections between the innovation capacity building process and improvements in socio-economic conditions of target communities
- To facilitate the capturing of wider/unexpected outcomes from implementing the project

These diverse requirements necessitated a composite mechanism with different individuals taking on the responsibility of different M&L components and informing each other towards a shared understanding (See Figure 1).

Figure 1. Different components of M&L system in FIP II



Source: Authors

KPO-level arrangements: The innovation coordinators were mainly responsible for this component of the M&L system. The learning and feedback loops were organised through the following mechanisms:

- Periodic consultative meetings held at respective KPO locations to promote reflective learning and re-planning. The project shared meeting proceedings with stakeholders, including members who could not attend these meetings.
- A scoreboard tool was developed and used to periodically track/quantify progress. The project initially planned on using two scoreboards simultaneously at each KPO. One was to be an 'external scoreboard', with the identification of parameters/

indicators⁴ and scoring/ tracking progress done in a consultative manner involving all key stakeholders. The other was to be called an 'internal scoreboard', with the identification of parameters/ indicators and scoring/ tracking the progress done by coordinators and key staff in the KPOs. However, the KPOs were reluctant to use the 'external scoreboard' as they thought commenting on others' performance might undermine the trust based relationships that underpinned their network. The internal scoreboard was expected to provide an unbiased view of the situation. A comparison of the two during the project period was expected to present changing dynamics of the networks, with parameters/ indicators being reviewed and readjusted periodically.

- The project developed nested log frames for each location based on specific objectives in each location that would logically fit into the overall project log-frame. It also undertook a periodic review of these log frames in each of the project locations.
- With the help of the innovation coordinators, the project team documented significant events, anecdotes and unexpected outcomes.

Monitoring resource utilization: This component aimed at ensuring the optimal utilization of project resources, both physical and financial. This was done through:

- Quarterly progress reports prepared by IC in a simple format. The project team reviewed these reports and acted on them to ensure field activities carried on smoothly.
- The project manager visited all KPO locations, at least twice a year, where he met the KPO representatives and the innovation coordinators. The frequency of these visits reduced during the later stages of the project.

Monitoring at the research management level: The project set up a research management group (RMG) led by the Thematic leader/ Research Manager and composed of the other researchers. The group met every quarter to monitor the progress of research efforts and plan for the subsequent quarter. The members were tasked with producing quarterly status reports on each KPOs, covering multi-stakeholder processes, the implementation of M&L, the KPO's actions to change the behavior of its stakeholders and significant events. These reports were shared among team members and discussed in the RMG meetings.

Engaging with policy: The Fodder Innovation Policy Working Group (FIPWiG)

The project envisioned FIPWiG as an interface with policy. It was promoted as having both an advisory and promotional role —raising issues for the project to address and promoting lessons and principles emerging from the pilot sites. Project leaders hoped the group would link the project to a policy-level debate on fodder innovation and would act as a mechanism for system wide institutional and policy change. In India the project approached the National Dairy Development Board (NDDB) — an apex organization in the dairy-livestock sector — to host FIPWiG in India. In Nigeria, in the absence of such an agency, selected individuals/ intellectuals who were influential in livestock policy and practice were brought together to form the group.

The first FIPWiG meeting in was held at the National Dairy Development Board (NDDB), with the agency's chairperson and staff in attendance along with representatives from the country's Planning Commission, Ministry of Agriculture (Department of Animal Husbandry), the Indian Council for Agricultural Research (ICAR), NGOs, co-operative milk unions and the Key Partner Organizations involved in the project. The project team presented the rationale of the project and the policy working group shared FIP's progress of the project thus far. A similar meeting was held in Nigeria, with representatives from the Federal Department of Livestock and Pest Control Services, Agricultural Research Council of Nigeria, National

⁴Example of the parameters/ indicators applied: Embracing the project approach; Openness & flexibility; Level of joint actions; Perceived value of interaction; Punctuality & commitment; Use of own resources for project activities

Animal Production Research Institute, KNARDA and Key Partner Organizations in attendance.

Participants in the workshops in both countries appreciated the importance of such a forum in linking research results to policy. They also provided feedback on how to link project outcomes to existing and future initiatives of the respective governments and what additional sets of activities needed to be undertaken for policy-level impact. FIPWiG members also agreed that there was a need to support and strengthen the existing field experiments beyond the project period in order to generate substantial evidence that could influence policy. In India, the working group asked the project team to broaden its evidence base by looking at other cases of fodder innovation.

The project responded to this request by undertaking two additional case studies on topics identified by FIPWiG. In Nigeria, the working group contended that FIPWiG could have had a greater impact on policy if it had been set upright from the beginning instead of meeting toward the end of the project. Its members also asked the KPOs to link their efforts to existing government programmes in order to strengthen and sustain these initiatives beyond the project period.

The project could not organize a second FIPWiG meeting because of time constraints. However, in India the project presented the results of additional case studies to the NDDDB chair, who expressed a desire to link the project team with a forthcoming exercise to prepare the National Dairy Plan.

4. DISCUSSION: CHALLENGES AND LESSONS LEARNT

This section presents some of the challenges faced by the project implementing team and the lessons learnt.

4.1 Project conceptualization and its communication/operationalization

One of the first challenges to confront the project was a perception among field staff and the external audience that the new FIP conceptual framework was too complex and difficult to get to grips with. To tackle this, the project developed and circulated a simplified four-page note that delivered the main messages of the framework. The team also developed a cartoon — which it used in conjunction with the four-page note⁵ — to communicate the conceptual underpinnings of the project to non-specialists.

The conceptual framework document also did not provide specific and detailed activity plans and operational elements. This was done on purpose as project leaders felt the new approach needs to be context-specific and flexible. Initially, this was a problem for the field-level implementing partners, who were used to conventional projects where interventions and activities are pre-determined along with the timeframe. However, interviews with the partners at the end of the project revealed that this motivated them to be creative and develop activities that were most relevant to their specific local contexts and based on articulated priority demands of the stakeholders.

4.2 Project roles

FIP's experiences indicate that four types of key roles are important in projects that are aimed at building innovation capacity of agriculture/livestock systems. These are:

- A leadership role with expertise in innovation system conceptualization and translating it into action. The key responsibilities for this role involve overall supervision for the direction of project activities and strategic decision making.
- A project management role that provides an enabling environment for the research and development partners. The key activities for this role are: day-to-day management of project activities, providing logistical support, ensuring financial flows, physical monitoring of project resources and ensuring communication.
- A unique role of an “Innovation Coach” (See Box 4) to support innovation capacity development activities⁶ at the field-level. Responsibilities include working with the coordinators of agency networks/ field-level functionaries and help them plan and implement activities as well as providing thematic guidance and reflection opportunities for the field-level project staff.
- Researchers in the project team with expertise in innovation system approaches and a good understanding of local institutional arrangements.

⁵(<http://www.slideshare.net/ILRI/capacity-to-innovate-what-does-that-mean-5038267>)

⁶All those activities that result in building appropriate agency networks and ensuring concerted action by them to address the problem (fodder scarcity in this case).

Box 4. Innovation coaching

To follow up the initial orientation of the innovation coordinators to FIP's conceptual framework, the project team also engaged them through continuous interactions, dialogues and reflections about the approach, the process and the lessons from the interventions over the project period. The team used meetings with the coordinators to reflect on events in the field locations and the processes involved. These discussions were mainly aimed at providing opportunities for the coordinators to understand their activities and resulting outcomes from an innovation system perspective. The team consciously avoided prescribing subsequent stages in order to allow the coordinators and their partners the freedom to decide on the activities in their respective areas. The project also organized Quarterly Review Meetings in the KPO locations on a rotation basis, inviting all the coordinators to come together and share their experiences from the previous quarter. These events were designed to encourage shared learning. For example, instead of formal presentations by the coordinators on the quarterly progress in their respective areas, the meetings employed panel discussions guided by a checklist. This approach enriched discussions by simultaneous and joint exploration of issues relevant in all the project locations.

Source: Authors

4.3 Nurturing partnerships

There were significant differences in the way partners were engaged in the two phases of the project. Table 3 provides a glimpse of these differences.

Table 3. Key features of engaging partners in the two phases of FIP

Key features	1 st Phase	2 nd Phase
Research partners	Specialist agricultural and veterinary research organizations	Specialist organizations with expertise in social science disciplines of innovation and science policy
Skills/capacities of development partners	Agencies with the capacity to transfer fodder technologies to farmers	Agencies that were willing to experiment with an appropriate configuration of actors to address fodder scarcity
Nature of agreements	Contractual	Collaborative relationships. Partners were part of the larger project team, assuming equal ownership of the project responsibilities and outcomes
Partners' participation in the project's strategic decisions	Limited	Full
Communication	Restricted	Free flowing and uninhibited
Failures	Not encouraged	Supported, with an understanding that risks co-exist with opportunities
Efforts by the project partners	Only to meet the contractual requirements	To find solutions with most potential impact
Partners' contribution of own resources for project activities	None. Treated as a discrete externally funded activity	Partners pooled in their human and financial resources to further project activities
Post-project sustainability and scaling-up/out	Not ensured	High probability as project partners made sincere efforts to continue with the scale-up/out and internalizing lessons and new ways of working in their organizations

Source: Authors

Even though the exercise was resource-intensive (time and money), the systematic process of selecting the field implementing partners (development partners) provided an opportunity for the project team to understand the strengths and weaknesses of diverse organizations and gain an initial understanding of the composition of the existing local innovation system in the potential project sites.

The partner leveling workshop was a useful step in developing in-depth knowledge about potential partner organizations and enable self-selection by the partners. It also provided an opportunity to communicate about the project and its approach to potential partners.

If the partner organization had been operating in the project location for a significant period of time and had established working linkages with different stakeholders, building the capacity of the system became 'easier' and 'quicker'. The reputation, credibility, legitimacy and social capital of the partner organization determined the chances for success of such efforts and the sustainability of outcomes and impacts.

The Innovation Coordinators had key roles in designing interventions in the field that were aimed at building multi-stakeholder networks. They needed to note and understand everything that was going on and use innovative ways to tactfully deal with obstacles and successfully build networks. The project could not prescribe what to monitor and where to intervene, as this depended heavily on local contexts and stakeholder compositions. Coordinators who had a prior relationship with stakeholders in the project location, and understood their habits and practices, found the facilitation of the multi-agency networks much easier.

The type of person selected as coordinator influenced the nature of the network built. In one case where the chief functionary of an organization was the innovation coordinator, his untimely death forced the project to discontinue the partnership as the sole connection with the organization was lost. The project was also forced to discontinue a partnership in another case where an entry-level employee was picked as coordinator and failed to understand the project approach and facilitate activities in the field. In cases where junior-level persons were recruited, extra effort was needed from the senior staff of KPOs to support them. Where senior/ middle-level managers played the role of coordinators, they were able to most effectively facilitate networks and also adapt lessons from the project into their organizational mandates. Some of them were supported by field staff as they could not work full time for project activities, due to other commitments. The project found such arrangements to be rather effective.

The project could not enumerate all the personal and professional characteristics that an effective innovation coordinator needed to be endowed with. However, the project team noted that that certain people seemed to possess natural abilities/ instincts to build networks. The project encouraged the innovation coordinators to foster such a talent — to establish relationships, strengthen linkages, troubleshoot, etc. — even if it was located elsewhere in the organization. In that sense, the innovation coordinator role was performed by different people from each KPO. Flexibility at the KPO level and the project team level was key in making this possible.

4.4 Nature of interventions

Activities proposed in the joint intervention plans, drawn up after the Rapid Diagnosis exercises, were not about gaps in institutional arrangements, despite the project planners hoping it would be. The activities were mostly of a developmental nature and based on technological solutions. However, the project team realized that these exercises were instrumental in bringing diverse agencies together to discuss various issues, which helped

achieve the first step in building an informal network of diverse stakeholders. The innovation coordinators played a key role in facilitating these discussions and assumed the facilitator's roles in these evolving networks.

In the end, two levels of interventions were initiated: 1) interventions at the field level by local stakeholders to address fodder scarcity and 2) interventions by the project at the organizational level to bring different agencies together in a network to influence their habits and practices positively towards joint action.

4.5 Networking

Building networks of stakeholders was challenging because the project could not mandate anyone to be part of such networks. The KPOs also did not have any legal or constitutional authority to mandate these actors to work together. In such a scenario, the innovation coordinators used diverse, context-specific strategies to form and sustain these networks; the project team focused on synthesizing lessons from such efforts.

The KPOs and their stakeholders were already aware of the benefits of working together with relevant actors. However, FIP gave them a pragmatic framework for achieving this. FIP's major contribution was to identify the need for a facilitator/ coordinator/ champion of such networks and providing the modalities for such roles. The project also provided the coordinators and KPOs with the necessary conceptual and logistical backstopping to perform these roles.

There was a lot of confusion about the role of researchers in the field. Given that they represented a science organization (ILRI), stakeholders from the field locations expected the researchers to play a proactive role, especially through the sharing of technological options to resolve fodder scarcity. However, the project looked to the research organizations (NARS) in the local systems to provide necessary technical knowledge and capacity building support to respond to emerging needs of the target communities, articulated through the network. This was expected to provide more appropriate and feasible solutions while ensuring the sustainability of efforts by creating linkages with local research actors.

The role of the facilitator/ coordinator cannot be understated, but is often missing in livestock systems. Agencies that can play such a role require skills and the capacity to navigate around challenges and build networks in order to achieve pre-determined objectives. They also need legitimacy in the eyes of different stakeholders in the system.

When the field level partners were encouraged to take charge of the innovation capacity building process, they owned the initiative and came out with interesting and unique ideas. For instance, one KPO (the Foundation for Ecological Security – FES in Rajasthan, India) initially used the project as a means to bring stakeholders together. At later stages of the project the organization communicated with its partners about other activities in its joint action plan and soon the agenda of its collaboration with its partners expanded. The ownership of the project approach encouraged the organization to up-scale it in other projects with other organizations. For instance, the three KPOs (FES, WOTR and JDPC) started applying the project's conceptual underpinnings in other projects during the project implementation period. The FES management formally appointed a three-member team (including an innovation coordinator) to ensure that the project's approach was adopted in other projects. This team was also tasked with orienting other project staff on this approach.

4.6 Monitoring and measuring change

Experiences from FIP indicate that conventional logframes alone may not be adequate for projects where the course of action is dynamic and requires flexibility to explore new opportunities and respond to emerging needs. The logframe developed at the proposal stage had to be reviewed and redrafted to suit emerging field realities. A mid-term review team, commissioned by the donor, agreed to this need, but also suggested developing nested logframes for each of the KPOs. The project team followed this suggestion and developed these in consultation with the innovation coordinators. However, during later reviews the coordinators said they did not find any additional advantage to having such nested logframes.

There was some confusion among the project team members on the types of indicators to be used to monitor progress. It was strongly felt that the use of conventional indicators for monitoring innovation capacity development was not appropriate. Considerable thought had to be given to development of appropriate indicators that could help capture the complexity of the process and outcomes.

The project could not implement a process of self-monitoring of changes in habits and practices through the use of the 'external scoreboard', given that network members felt uncomfortable in judging each others' habits and practices. However, project leaders felt that such tools could be used when networks mature and sufficient trust is built among their members.

The project team also faced a dilemma over the question of how to implement the baseline studies — over whether these should inform planning of project interventions or whether they should merely be used as a tool to generate data for post-project impact assessment. The baseline could have served both purposes, provided they were designed and implemented well in time at the start of the project. The information generated could have complemented what was generated through key informant interviews and expert knowledge in order to inform the design of interventions to address fodder scarcity.

The project experiences indicate that the impact of improved conditions at the organizational level/ system level — achieved through project activities — would not be limited to a few selected villages. Sometimes impacts were more significant in other villages than the villages that the project directly targeted because changes are focused at the system level and play out differently in different locations. This necessitates a rethink of the traditional M&E frameworks and development of methods that could enable capturing system wide impacts, most of which could be intangible and based on organizational and behavioral changes.

Experiences from the project showed that the institutional baseline demands investing quality time in understanding tacit details as this is critical for coming up with a comprehensive and pragmatic analysis. Otherwise, there is a danger that the study would end up in a superficial analysis with stereotypical views on stakeholders, and cannot highlight unique characteristics of the innovation systems in specific locations.

5. CONCLUSIONS

Building capacity of the system to enable innovation is a daunting task. However, this might be the most appropriate way of addressing agriculture and rural development problems in a sustainable manner. The following are some of the key take home messages from FIP II for designers of projects that aim to build innovation capacity of systems to address agriculture and rural development problems.

- Projects that are trying to follow a network building approach should be planned for longer durations. Three-year projects are too short for exploring innovation capacity building modalities. A minimum five-year project duration with a one-year preparatory phase appears to be more pragmatic.
- An elaborate preparatory phase is essential. This should start with developing a conceptual framework and include activities such as building the project team, selecting the partners, building rapport, communicating the project conceptualization, diagnosis of the existing innovation system and identifying intervention themes for the project locations.
- A non-hierarchical project management structure is ideal for such projects, consisting of people specialized in technical, institutional and innovation systems areas. They need to be supported by a project team that can ensure necessary logistics and enabling conditions.
- The project team should have 'Innovation Coaches' who have knowledge and skills to provide necessary conceptual orientation and reflection opportunities for field-level functionaries to facilitate activities to build innovation capacity of agriculture/ rural development systems.
- Partnership modalities between the project team and its partners need to be based on collaboration and mutual accountability principles, which should be reflected in the partnership agreements and practice.
- Ideal partners for the project are agencies that are embedded in multi-stakeholder networks and are respected by local stakeholders. These agencies should be willing to play the role of innovation champion/intermediary/driver.
- Determining starting conditions through socio-economic and institutional baselines is useful for establishing plausible causal connections between innovation capacity development and associated changes in the socio-economic conditions of the target populations.
- Developing and implementing a monitoring and learning system that can ensure continuous generation of lessons from activities, their dissemination to different agencies associated with the project (both within and from outside) and flexibility for readjusting action plans based on lessons is challenging but essential for such projects.
- Action research methodology is apt for exploration of innovation capacity building processes. Increasing number of action learning loops enhances the quality of project outputs and impacts.

- Communicating innovation system conceptualization to implementing partners cannot be done through a document or a onetime training programme. It needs continuous engagement and interaction. Due to this, 'innovation coaching' has an important role to play in projects that are aiming to build the innovation capacity of systems.

6. END NOTE

Evidence presented about the outcomes of the fodder innovation project make a clear link between the strengthening of innovation capacity (and the networks and routines that underpin this capacity) and both immediate field-level and long-term impact that have development relevance (Hall et al., 2010).

These immediate field-level outcomes include improvements in fodder viability; improvements in animal health and upgrading of animal production and marketing systems through a mixture of technical, organizational and institutional innovation. The interventions also triggered several institutional and organizational changes such as the articulation of new demand for services, knowledge and research support, new roles taken up by some of the actors, better and relevant feedback for researchers, to better governance of public services.

For more details on these see

http://www.crispindia.org/docs/FIPFinal_conference_abstract.pdf

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