Extended abstracts of the papers presented

Enhancing Capacity for Innovation: Learning from Practice

A conference of Fodder Innovation Project (FIP) II

5-6 May 2010
C F Bentley Conference Centre,
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Session 1: Setting the scene

The Fodder Innovation project: Reframing fodder scarcity as capacity scarcity

Andy Hall

Project rationale

The critical role of livestock in the livelihoods of poor people and the challenge of access to adequate fodder are well established. Equally there is a long history of research and technology promotion activities seeking to introduce improved fodder varieties/crops, agronomic practices and natural management regimes to tackle the fodder scarcity problem. The success, however, of these efforts in terms of bringing about technical change has been disappointing. The Fodder Innovation Project set out to address this problem from a different perspective. It argued that fodder scarcity was not an issue of technological scarcity *per se* that could simply be solved by introducing new technologies. Instead it argued this problem was one of innovation capacity scarcity.

Drawing inspiration from contemporary thinking on the nature of innovation as process of putting ideas and technology into use and the notion of an innovation system as a heuristic for the type of capacity needed to do this, the project understood capacity in a broad sense. The contours of this capacity were viewed not just as the skills and resources of different organisation and individuals. In addition, and arguably more importantly, this capacity was understood to be the links or networks that connected producers and users of information and ideas and the ways of working that enable these networks to mobilise ideas and technologies and put them into use.

The project recognised that many ideas and technologies to address fodder supply were already available. It also recognised that many organisations and many formal and informal networks and alliances already existed. The projects hypothesis, however, was that if it could find ways of facilitating the strengthening and orientation of these networks through which innovation emerges it could help create the conditions that would allow fodder innovation to take place . And critically it would identify how livestock research could become embedded in these networks thus improving its contribution to technical change and the welfare of livestock dependant poor people.

Research approach

The approach of the project involved partnership with a variety of mainly field based development and research organisations -- referred to by the project as key partner organisations KPO's. The role of the KPO's was to explore ways of strengthening networks around fodder related themes. There was no set plan for how this should be done and an iterative action research approach was followed. The project research team backstopped the KPO's network strengthening activities. At the same time it also

formalised lesson learning about how network strengthening was facilitated and what were the resulting effects of this. The project made explicit efforts to employ systems ideas in both its research exploration of network development as well in its management approach. In relation to its research, this meant following opportunities and recognising unexpected outcomes rather than sticking rigidly to predetermined plans. In relation to its management approach this meant both a relationship of co-learning with partners as well as strong emphasis on critical self reflection on the effectiveness of the approach being taken.

Nature of lessons learnt

The systems orientation of the project approach dictates that lessons from FIP fall into two broad categories. The first category concerns what has been learnt about how network strengthening can be facilitated: what organisations, roles and actions are required; how should this process be approached in different contexts; and what are the consequences of this sort of innovation capacity development in terms of technical change and welfare. The second category concerns what has been learnt about implementing an innovation capacity development approach in a research project: how should partners be selected; how should activities be monitored; how should expectations of different stakeholders be managed; and what modifications of project management frameworks are necessary. Connecting these two types of lesson are the implications that these two sets of lessons have for policy and practice associated with livestock-based development.

Headline lessons: facilitating innovation capacity development

- Establishes the link between innovation capacity strengthening and improvements in fodder access, livestock production and marketing. Illustrates that the approach can be made inclusive of the poor.
- Identifies the critical role of brokering as a way of facilitating the strengthening of networks and identifies the types of organisation that can play this role.
- Illustrates the diversity of starting points that can be used to focus network strengthening (some unrelated to fodder).
- A general pattern emerges where the innovation focus is on upgrading production, marketing (dairy) or natural resource management systems and where it becomes worthwhile tackling fodder specifically only once these systems have been upgraded.
- Evidence of the non-linearity of outcomes that emerge from an innovation capacity development approach – some fodder related, some more generally livestock related and some related to wider aspects of rural development.
- Evidence that strengthening both innovation capacity and promoting innovation leads to articulation of new demands for research. Quite often livestock system upgrading can continue for some time by relying on existing information. However capacity strengthening seems likely to accelerate this demand for research.

Headline lessons: Project reflections

- High levels of resources and time needed to establish and nurture the initial set of partnerships with the KPO's , explain new approach and identify starting points for action in the field. This takes at least a year and suggest that at a minimum programmes should run for a year.
- The need to establish dialogue with policy stakeholders as early as possible.
- Institutional and socio-economic baselines not a particularly effective way of monitoring impact. Partially dues to the trade off between precision and cost and partially because the non-linearity of outcomes makes the geographic location of impact hard to predict at the outset of the project.
- An action research approach means that special emphasis needs to be given to M&E as a management tool in field level operations. However rather than trying to develop a uniform approach suited to researchers' needs for information, developing tailor made approaches with individual organisations (KPO's) is much more effective.
- Highlighted a number of tensions between old and new ways of working within the project team. Was this a research or a development project? Should the project deliver impact at scale or should it deliver lessons on how to strengthen fodder innovation capacity? Were the partners sub-contractors or co-learners? How should communication be organised in the project? A professional project manager in charge of resource accountability and a research leader responsible for approach and conceptual orientation could help resolve these tensions.

Implications for policy and practice

Investing in innovation capacity development seems to be a powerful way of stimulating fodder and other related innovation that are relevant to poor people. The FIP illustrates how that sort of investment could be packaged as a new type of hybrid project that straddles research, development and social learning. One important implication of the research is that the sorts of approach adopted by the project is a legitimate way of learning lessons on better was of deploying research and innovation processes for pro-poor livestock development. Organisations such as ILRI could take this project forward by making more use in their project designs of the principles developed on strengthening innovation capacity. ILRI should also give a more prominent role in its technical projects to the sort of lesson learning and social science/ innovation studies research that this project has piloted. Not only will this help ILRI learn how to mobilise research and other ideas for livestock development, but in addition such lessons will be an important international public goods contribution on how to deploy agricultural science for pro-poor development. Such contributions would justify ILRI's (and indeed other IARCs) continued engagement with local systems of livestock innovation that by necessity are focused on developmental approaches and outcomes.

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Session 2: What we did..

Paper: Steps to actions in FIP – operational details

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The second phase (2007-2010) of the Fodder Innovation Project (FIP) defined fodder scarcity as the problem of lack of capacity of livestock system, rather than the problem of technology and information scarcity, as it was hypothesized in the first phase (2003-2006). This change in conceptualization required a fundamentally different approach to addressing the challenge and designing supporting actions to addressing the objectives. This paper describes the evolution of the different stages of the project and steps involved.

Creating an intermediary theory

The first activity in the Project was to clarify the scope of the Project and its conceptual underpinnings. This was achieved by developing a conceptual framework for the project, explaining the concept and use of innovation system framework in agriculture and rural development, its merits and challenges and ways of adopting/adapting it for Phase 2 of FIP (http://www.fodderinnovation.org/publications/FIPConceptual_Framework.pdf). Fodder innovation capacity and ways of strengthening it, and tools that could be used for diagnosis of institutional change were also described in the document, along with the research hypothesis. The project personnel, new staff joining the project and staff of partner organizations used the conceptual framework to inform themselves about the direction of the project and the rationale. During the course of the project, this document served as the major communication tool for the project to explain about the project and it's new approach.

Project management

The project due to it's evolving nature, where activities emerged based on the outcomes of the previous ones, required a flexible management structure to accommodate continuous change. The focus of the project was on approaches and processes, rather than very technical livestock or fodder related elements. It was designed to be an action research project with impacts on enhancing capacity of the system and putting knowledge into use. This required deep engagement with a diverse set of partners and stakeholders, and maintaining continuous and extensive communication with them. This required promotion of a different type of project management structure as compared to Phase 1. Two clearly definable functions emerged for the project management – firstly, a thematic/research leadership function to spearhead design, implement and monitor actions/activities to understand and analyze ways of building innovation capacity and secondly, a project management function that provides an enabling environment for the research leadership and especially, nurture relationships with the key partner organizations (KPOs). Another function that evolved along the way, was that of innovation coaching at the field level to support innovation capacity development activities. Since the Project management structure was continuing from the previous phase, a complete overhaul was facilitated during the project period through negotiations, resulting in a research leadership role supported by a project management role and Innovation coaching.

Promoting mutually responsible partnership modalities

This action-oriented research project had two sets of key research and development partners. The key research collaborators were innovation and science policy analysts and, the implementing partners at the field level were established development organizations with proven capabilities and competencies. They were engaged as equal partners and on an equal footing in the Project by appreciating the fact that they held key responsibilities for success or failure of the project, and all decisions were taken jointly. Nature of partnerships were collaborative than contractual with mutual responsibility, reflected through flexible contractual agreements.

Two stage process of selecting the Project implementing partners (KPO)

Due to the significance of the role, the KPOs were selected through a detailed two stage process. In the first stage, an elaborate – **"Partner Landscaping Study"** – was undertaken in India and Nigeria to screen organizations associated with the livestock sector for their suitability to partner with the Project. The first order criteria that were used were (a) history or interest in working on fodder related issues (b) Sympathy to the approach evident through their 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 organization or have a learning culture; and evidence of history of partnering with a diversity of organizations or being part of or coordinating relevant networks (c) Diversity of partners to include different organizational types (public, private, NGO); livestock systems in which they are working and; degree of market integration (covering commercial to subsistence spectrum) of the systems (d) Poverty and equity relevance of the *ag*enda and activities of the partner organization. This meant that the organizations are not working mainly or exclusively with poor livestock keepers, or with particular social groups such as women or tribal communities, rather whether their agenda or activities relate to the wider livelihoods of the poor through livestock routes; for example, employment; selling fodder or livestock related services. The second order criteria included (e) Scale and links to policy relating to the scope of an organization's activities and the potential for diffusing outcomes in this domain and exploiting opportunities present for up-scaling through wider policy and institutional change (f) Social science expertise to involve in analytical skills, process documentation and lesson learning.

In the second stage, the short-listed organizations were invited for a **"Partner Leveling Workshop"**, where the Project approach and its conceptual underpinnings were discussed to help participants to decide whether their organizations would be willing to partner with such a Project. This workshop also helped the project team to 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.

Selecting 'Innovation Coordinators' and supporting them

Upon selection, the KPOs were asked to recruit 'Innovation Coordinator' for the Project who would be responsible for leading implementation of activities in the field. The selected candidates were exposed to the Project's conceptualization during an 'Induction workshop' by using real-life cases of agricultural innovation. Subsequently many reflection opportunities were provided during the Project period to help them analyze and orient their activities in the field.

Building rapport with the partners

Different opportunities such as field visits to selected project locations, meetings with key staff of KPOs and 'Institutional History' documentation, were used to build rapport with the KPOs.

These helped address concerns and clarify project's approach. This stage was very important as the relationship between the Project and its partners needed to be open and transparent.

Initiating activities in the field

Identifying specific activities to build innovation capacity was challenging. The initial idea was that an elaborate Institutional diagnosis will form the base for developing action plans. Since it is a complicated one requiring elaborate study to understand unique features of each location, a rapid diagnosis exercise in each of the areas by involving different agencies through a workshop was undertaken to jointly assess the issue and identify an intervention theme for respective areas. These themes were discussed during the Induction workshop to understand the problem from an Innovation system perspective. Later, joint actions plans were developed for each of the locations, by respective multi-agency networks. These activities were implemented by groups of relevant agencies with the whole network monitoring the progress.

Implementing research

An action research methodology was employed to explore ways of building innovation capacity. Building informal and 'loose' networks of different agencies and shaping those networks to achieve the Project's objectives was the underlying principle. Significant events and activities in the project locations were captured during discussions with KPO functionaries and their partner agencies. Analysis of these and synthesis of lessons was undertaken at the Project level, by involving KPOs at appropriate times. "Internal research symposia" and "Quarterly Review Meetings" were organized during the project period to take stock of research periodically and determine the focus for the remaining period. During the former, researchers and practitioners connected with the sector were invited to share the findings and analysis, and receive feedback.

Monitoring and Learning (M&L)

Monitoring in the Project was promoted as a learning tool to guide activities and provide lessons for synthesis. The activities were monitored at two levels. At the KPO level, a 'score-board' was employed to understand changes in habits and practices of their network members. This was a self monitoring tool to set directions for their activities. Self-monitoring of physical activities was undertaken through regular review meetings of network members. These happenings were communicated to the Project team members through quarterly reports and during meetings and discussions.

At the Project level, quarterly reports were submitted by the team members about activities in each of the Project locations to the research leader, for analysis and synthesis. Weekly project team meetings were employed to review and plan project activities.

Starting conditions were established through socio-economic and institutional baselines in the Project locations, such that plausible causal connections between socio-economic advancements of target communities and innovation capacity building at the system level could be established.

Engaging with policy makers – Fodder Innovation Policy Working group (FIPWiG)

Working groups, termed Fodder Innovation Policy Working Group (FIPWiG), were promoted with high-profile decision-makers selected from different agencies associated with the livestock sector, at the national level in India and Nigeria. This group was to serve as an interface for the Project with policy makers in respective countries to engage in policy dialogue.

Conclusions

Flexibility and selection of partners is key for implementing R4D projects that are aimed at exploring innovation capacity development. Developing a conceptual framework is an essential

first step for projects to have focus on the activities. It is useful to designate a “zero year” for a project, during which many activities would be undertaken to set up a project in the field.

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Session 2: What we did..

National Agricultural Innovation Project: Approach and Some Implementation Experiences

Mruthyunjaya

National Agricultural Innovation Project (NAIP) was launched by Government of India during July, 2006 to facilitate the accelerated and sustainable transformation of Indian agriculture for poverty alleviation and income generation by collaborative development and application of agricultural technologies by the public research organizations in partnership with farmer's groups, Panchayati Raj Institutions, private sector and other stake holders.

NAIP responds to the changed socio-economic context of Indian agriculture by strengthening the Indian Council of Agricultural Research (ICAR), the premier partner of National Agricultural Research System (NARS) as a catalyzing agent of management of change and pushes the frontiers of scientific capacity, market orientation and livelihood security. The major idea of NAIP is to put agricultural research into action to increase production, income and livelihood security of people engaged in agriculture on a sustainable basis by promoting excellence in science (through basic and strategic research) and strengthening the research system itself (through O & M reforms).

Persisting problems of poverty, hunger, malnutrition and new challenges of climate change, energy concerns, price volatility, economic shocks etc. require entirely new skills and skills of 1 or 2 individuals/disciplines/institutions/agencies will be insufficient. NAIP pursues consortium of partners (public sectors, CGO, private sector, NGOs etc.) by pooling the talents and resources of all relevant partners who bridge the missing links (gaps) of a problem and share the resources with clear cut entry and exit points. Similarly, NAIP avoids segmented approach by promoting end-to-end solution by linking production, processing, marketing, and consumption (quality and safety) together.

To succeed in achieving project objective, NAIP design envisages certain process reforms/ changes also. They are as follows:

1. Competitive funding of the sub-projects: In NAIP, nearly 85% of the sub-projects have been selected through competitive funding method through national level call and sub-project development from concept note stage to full project stage by multilayer rigorous project review with clear cut guidelines and scoring system. Such a review has resulted in only 10% of concept notes (total submitted about 1500) finally approved as sub projects. Project proposals are prepared with a comprehensive outline covering technical, financial details, activity, M & E framework, E & S safeguards framework and project sustainability plan.
2. Creation of a helpdesk to assist in match making and project preparation (right partner identification and assist in selection of concept note/project proposal preparation including preparation of environmental and social (E&S) safeguards framework). Yet another process change is to hire a professional consulting firm for baseline survey, concurrent project monitoring and reporting during the entire project period.
3. Formulate small number of bigger projects to make system wide impact: The average size of the project is about Rs 5.5 crores, through it was originally planned to be of the

size of about Rs 15 to 20 crores. But, the NAIP projects are much bigger than the NATP projects (NAIP's predecessor project) of an average size of about Rs 1 crore plus.

4. Plan for massive human resources development: About 900 staff will be trained abroad in either NAIP project areas or 26 cross cutting frontier areas of agriculture sciences. Further there is a plan to train about 1000 Indian agricultural scientists from international experts. Capacity building of this scale is happening for the first time.
5. Doing science differently is a new feature of NAIP particularly on value chain and livelihood security. Scientists including those who were involved in review of NAIP sub-projects, either in their training or in practice afterwards, pursued such projects which connect science to commerce (value chain) and science to society (livelihood security) . The change was difficult, time consuming but successful because scientists/ reviewers liked it as they could find the purpose and hence co-operated.
6. NAIP adopted a disclosure plan which was transparent and informative and hence immensely contributed to high credibility and public trust on the people, process and products of NAIP.
7. Co-financing is also attempted with IFAD and SLEM-GEF to bring in outside expertise to focus on new skills and sustainability of natural resources especially in the context of climate change.

NAIP by funding 187 sub-projects, almost exhausted the entire outlay of Rs 1200 crore. Roughly, the allocation of budget is equal among all the four components, emphasizing the importance of each one of them. In the action research projects (on value chain and livelihood security), the non-ICAR/SAU partnership is more than 50 per cent(was less than 10% under NATP).

The main initial experiences (project is 4 years old now, to be completed in 2012) are as follows:

- The technical progress of NAIP sub-projects are rated as satisfactory. The expected benefits are slowly trickling.
- Scientists in ICAR/SAU system are now very comfortable with working with other scientific agencies, private sector, NGOs, CSOs etc.
- Scientists in ICAR/SAU system can now think and act beyond science
- Planning and executing bigger and innovative projects is slow and gradual process
- Understanding and articulating M&E and E&S framework was difficult but done fairly well
- Competitive funding is now well come by the users
- Transparent and responsive governance contributes to building public confidence and smooth project management
- Financial management and procurement can severely constrain project progress
- NAIP is not only scaled up research (investment) project but also human resource and O & M development project
- Consortia are still functioning and contributing to the project goals – partnership in practice. The involvement of the development departments and convergence is still a major challenge/concern
- Amending rules and procedures by the national government as well as the World Bank(donors) is critical to the success of such time bound, pilot projects which are conceived to build role models for regular programmes, whenever done yielded amazing results
- Documentation, communication, publicity is a major concern/ challenge
- The globe is watching the NAIP for lessons/experiences/follow-up. Further, it is a project with loan from the World Bank. Hence, nobody can afford to be casual, less committed.

NAIP provided ATMA model to Government of India for replication during 11th FYP. What NAIP will give to the nation during 12th FYP is important because the preparation for formulation of 12th FYP by the Planning Commission has already started.

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Session 3: Outcomes in the field

Livestock and Fodder Outcomes

Ranjitha Puskur, Vamsidhar Reddy TS

The Fodder Innovation Project was designed to address the challenge of fodder scarcity in mixed crop-livestock systems in India and Nigeria, through nurturing networks to build innovation capacity of the livestock systems. The project was operational in 5 sites representing diverse agro-ecologies and livestock systems in different stages of intensification (Table 1).

Table 1. Crop-livestock systems in FIP Project sites

Site	*Crop-Livestock system*
AhmedNagar, India	Semi-arid, 566 mm annual rainfall, drought prone, irrigated, sorghum+millets+pulses+dairy+ small ruminants in rainfed areas Sugarcane + Cotton + intensive dairy production in irrigated areas
Bhilwara, India	Semi-arid, 550 mm annual rainfall, drought prone, intensifying, Wheat+Maize+Pulses + dairy and small ruminant production
Puducherry, India	1100 mm annual rainfall High rainfall, humid, irrigated, urban and peri-urban, Ag only 25% of employment, Rice+sugarcane+coconut+pulses+intensive dairy+sheep+pigs, 80% of cattle crossbred
Ikire, Nigeria	1200mm annual rainfall, humid, Cassava+Maize+Yam+vegetables+Cocoa+goats
Kano, Nigeria	700 mm annual rainfall, drought prone, cowpea+ sorghum+millet+maize+rice+groundnut+soya beans+vegetables+dairy and small ruminant production

Based on the challenges associated with feeding the livestock in the respective project sites, the KPOs jointly with their network members identified themes for action research (Box 1) and to rally network members around. These themes were broader than just fodder, in some cases. Based on the themes selected and priorities of network members, feasible entry points were identified to kick start the action (Table 2). Based on the themes and entry points, KPOs planned interventions including combinations of technical, organizational and institutional options. The interventions are very context-specific and have been designed based on the demands of the stakeholders and the problem situation with regard to addressing feed scarcity to promote livestock enterprise development. In general, the interventions spanned areas of breeding, feeding, animal health, access to markets, institutional arrangements and, capacity building in all the sites, highlighting the fact that addressing fodder alone in such interventions will not be effective and one needs to look at the value chains. Different innovation trajectories evolved as a result and different outcomes too. The immediate outcomes have been mainly in the form of (a) improved access to fodder – from common property resources like grazing reserves and forests; from enhanced use of dual purpose crops; increased production of crop residues due to

Box 1. Research Themes

- ***Ahmednagar, Maharashtra, 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.
- ***Bhilwara, Rajasthan, India*** - An experiment in developing a mechanism to coordinate complimentary technical (including fodder) and institutional support in order to upgrade smallholder dairy systems.
- ***Puducherry, India*** - An experiment in establishing an integrated fodder production and marketing system based on farmer fodder entrepreneurs.
- ***Ikire, Osun State, Nigeria*** - An experiment in connecting and coordinating existing systems (markets, religious / ethic groups, technical support, policy and traditional institutions) to facilitate the transition from subsistence to commercial goat production.
- ***Dambatta, Makoda and Rogo, Kano state, Nigeria*** - An experiment in connecting and coordinating existing systems (markets, religious / ethic groups, technical support, policy and traditional institutions) in order to address seasonal fodder shortages in mixed crop livestock systems

enhanced fertilizer use and; through use of improved varieties of fodder and food-feed crop seeds (b) organization of communities to build social capital and access services and inputs more efficiently (c) enhanced capacities of various actors especially poor and women livestock keepers (d) enhanced access to markets through the networks created (e) enhanced access to services – veterinary services, agro-inputs like fertilizers and chemicals, veterinary drugs and vaccines, credit, knowledge through extension services and linkages with other actors like marketers and dairy co-operatives etc.

This paper attempts to highlight some of the livestock and fodder related outcomes that were realized in the project sites.

Table 2. Project sites and entry point activities

S.No.	*Project Site*	*Entry Point activities*
1	Bhilwara	Vaccination for animals
2	Ahmed Nagar	Fodder production and use from forest areas
3	Puducherry	Fodder production in private lands
4	Rogo	Re-organizing agriculture extension services in rural areas to ensure uniform coverage and avoid duplication
5	Dambatta	Accessing credit by farmers
6.	Ikire	Linking goat farmers to markets

a. Enhanced access to fodder

- In one of the Ahmed Nagar project villages, 50 ha of identified forest area was reseeded with an improved stylo variety and the grass is made available to poor livestock keepers. Plantation of fodder tree species on private wasteland was done by the farmers with the support of the Social Forestry Department as a part of the Maharashtra Employment Guarantee Scheme.

- In Bhilwara, the project has been able to address the fodder and water issues in the project area with taking pasture lands development and works on water harvesting under NREGA and NABARD supported watershed development work. 518 ha of village pastures in 17 villages were developed under NREGA and works to augment the ground water and surface watershed availability has been taken up watershed development project. The climatic condition in the area has always been unfavourable with recurrent drought conditions and failure of crop and reduced fodder growth. These interventions has helped the rural communities in mitigating the impact of drought to a certain extent especially with respect to fulfilling the water and fodder scarcity issues but still a lot more that has to be done. Systems have been put in place to ensure that benefit sharing in terms of the fodder and water remains pro-poor and also to ensure the rightful representation of the poor in the decision-making processes at the village level.
- In Puducherry, cultivated green fodder is being produced and sold in the range of 250-1000 kg/day, depending on demand which is determined by availability of crop residues. Diverse institutional arrangements emerging to link fodder producers and buyers emerged which reduced the transaction costs and made fodder accessible to the landless livestock keepers, especially women and their Self Help Groups
- In Rogo, the records show that the average yield of Maize increased from 3 tons/ha to 4-4.5 tons and that of Soybeans from 1 ton/ha to 1.5 -2 due to increased use of fertiliser. In Dambatta, grazing reserves have been reclaimed, being reseeded and, boreholes sunk to increase water availability for livestock in the reserves. It was estimated that 800 tons of fodder was produced here and an estimated number of 8000 cattle and small ruminants grazed there last year. Individual farmers producing lablab and cowpea fodder using improved varieties.

b. Enhanced access to services and resources

- **Veterinary services:**
  - In Rogo, the access to veterinary services enhanced with the engagement of para-vets.
  - In Ikire, 15 community members were trained to be para-vets who are now mainly involved in de-worming and providing first aid to animals.
  - In Bhilwara, the Animal Husbandry department's (AHD) regular vaccination programme through door-to-door approach usually covered about 90 animals in a day. During these camps an average of 975 large and small ruminants were covered in a day. During the 2 years, the group collectively conducted 14 camps with 4312 big and 9325 small animals being vaccinated.
  - In Puducherry, an Animal Health camp was organized where poor livestock keepers got their cows treated for various reproductive disorders.
- **Extension/Knowledge services:**
  - In Kano, Extension Agents from 3 different organizations brought together to engage in dialogue to avoid duplication and streamline extension services provision. This resulted in enhanced access to extension services (leading to farmer mobilization and group formation – first time in this area), increased demand for farmer groups, reduced costs and more efficient service delivery.
  - In Ikire, relevant actors (JDPC, OYSADEP, LG and trained para-vets) now provide timely extension & veterinary services.
- **Agro-inputs including veterinary drugs and vaccines:**
- In Kano, farmers access to quality agro-inputs improved. There are more outlets now, about 3 new private companies (seed and fertilizer) involved, agro-input suppliers reduced the size of packaging to make them affordable to farmers and enable buying in small quantities as and when required.

- In Ahmed nagar, the Agricultural University started packaging stylo seeds in 5-10 kg bags, to make it affordable for the poor farmers and livestock keepers.
- In Ikire, livestock farmers groups have been linked with vaccine/drug suppliers and marketers in their respective local government areas and have commenced direct interaction. A new interaction has developed between National Veterinary Research Institute (NVRI-government vaccine suppliers) & JDPC regarding vaccine supply for African swine fever. Now there is a steady supply of PPR vaccines by NVRI. Farmer umbrella association integrating the coordination of routine deworming, vaccination exercises, monitoring of group projects and networking with other agencies into their programme.

- **Credit:**

- The Bhilwara dairy co-operative established rapport with the farmers and started diversifying it's services provided to community – including providing loans for marriages, insurance etc to get their buy in.
- In Ahmednagar, the District Co-operative Bank changed it's loan policy and started giving fodder loans to farmers.
- The Department of Agriculture increased the subsidy for fodder cultivation from Rs.4000 to Rs.5000 per acre.
- In Kano, crop-livestock farmers accessed bank credit worth 5.9 million Naira for buying agro-inputs.

c. Access to fodder, milk and meat markets

- In Bhilwara, the linkage created with the dairy co-op society during the vaccination camps, resulted in enhanced market access for the communities. Consequently, the procurement of milk by the Dairy co-operative increased by 41%. The presence of the private sector in milk marketing also forced the Bhilwara dairy to form alliance at grassroots level and improving their service sectors to ensure that there is stable milk supply to DCS.
- In Puducherry, the gross income of an entrepreneur from fodder sale last year – about 3000 USD (employing family labour). However, there is a question whether this would be a viable enterprise if labour is hired.
- In Ikire, goat marketers providing extension information to producers in anticipation for future availability & access to goats to buy from producers. Goat producers and marketers' are forging a relationship based on exchange of information.

d. Enhanced capacities

- Capacity building of about 301 livestock keepers (mostly women), farmers and co-operative society staff in Puducherry.
- In Ikire, 32 farmers were trained in goat production. Improved goat production & management practices - some goat producers have now opted for collective confinement and a cut and carry strategy. In a dialogue of farmers with various stakeholders, farmers had the opportunity to understand 'breeding' in a layman's sense, consequences of in-breeding etc. They carried out an on-the-spot assessment of their breeds with the experienced marketer & animal health specialist to re-examine their breeds & reached decisions on possible ones to dispose. The marketer agreed to help in sourcing additional viable breeding stocks.
- In Kano, farmers learnt about early maturing and drought tolerant varieties of crops and implications for animal feeding; strategies for improving fodder quality and productivity – e.g., combining the leafy and stem parts of crop residue as stock feed; agronomic practices for some dual-purpose crops (Maize and Sorghum) and forage crops; new fodder crop varieties such as lablab, stylosanthes, centro etc.

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Session 3: Outcomes in the field

Making Legumes Lucrative: The Malawi Seed Industry Development Project

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Until the late 1970s Malawi had a well-established reputation in the United Kingdom as a producer of high quality confectionary groundnuts, with annual exports of around fifty thousand tons. At that time all agricultural inputs were channeled through the Agricultural Development and Marketing Corporation (ADMARC), which also had a statutory monopoly on output marketing.

In the early 1980s the Malawi Government was anxious to boost production of the staple food crop maize, which it did by providing subsidized seed and fertilizer on credit through ADMARC. The favorable controlled prices for maize relative to groundnuts resulted in farmers reducing their groundnut acreage and by the late 1980s Malawi had ceased to be a groundnut exporter.

In the early 1990s structural readjustment led to the dismantling of ADMARC's buying monopoly, with the result that groundnut prices rose relative to maize leading to a rapid expansion in groundnut acreage.

Groundnut exports to the UK in the 1970s were of the long-duration Virginia variety 'Chalimbana' that had been selected by breeders in the 1960s who were then employed by the Agricultural Research Council that served the Federation of Northern Rhodesia, Southern Rhodesia and Nyasaland. With the breakup of the Federation in 1963 and Nyasaland's subsequent independence as Malawi in 1964, there was a hiatus in agricultural research, including groundnut breeding. This was only seriously addressed with the establishment of the Southern African Development Community's (SADC) Regional Groundnut Improvement Program in Malawi implemented by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) in the early 1980s. By 1990 the SADC/ICRISAT Program had developed an improved high-yielding Virginia variety that was released in Malawi as CG7, and MGV4 in neighboring Zambia (previously Northern Rhodesia).

The earlier maturity, around 20 days, and significantly higher yield of CG7 were well received by farmers, but their was resistance from the trade which wanted the larger-seeded 'Chalimbana' variety, even though productivity was roughly half of CG7, and

even less in poor rainfall years when the yield of the longer-duration 'Chalimbana' variety was significantly worse than CG7. The resistance to CG7 was only overcome when ICRISAT sent CG7 samples to the UK for roasting tests, which were positively received. The opinions of local traders were based more on nostalgia for the variety they knew, rather than being informed by the needs of interested buyers with whom they had very little interaction.

Despite the popularity of CG7 with farmers, adoption from the time of release until the late 1990s was slow because none of the commercial seed companies were interested in marketing groundnut seed, which is bulky, perishable, and can be recycled for several seasons without significant loss in quality. To address this shortcoming ICRISAT established a seed revolving fund whose primary aim was to ensure that seed of released varieties was properly maintained, and to ensure sustainability proceeds from foundation seed sales was re-invested back into the revolving fund. Since the fund was established in 1999 most seed sales have been to non-governmental organizations and to farmer associations, but in 2008 the Malawi Government decided to include groundnuts in the input subsidy program (ISP).

Under the input subsidy program selected farmers receive a book of vouchers that can be redeemed for seed of specified crops and fertilizer through established agro dealers. The initial demand for groundnut seed from the ISP was several thousand tons and because no commercial seed companies had shown interest in the crop the government put out tenders that resulted in seed of unknown origin and variable quality being sourced from local markets. The Seed Trade Association of Malawi (STAM) which is a membership organization representing the interests of seed companies objected to the government approach on the basis that it undermined their efforts to promote certified seed which inevitably costs more. In response government changed its policy and now all seed exchanged for vouchers has to be certified.

The change in government policy has resulted in a surge of interest from organized groups of farmers, including the National Smallholder Farmers' Association of Malawi (NASFAM), in certified seed production. This has stimulated demand for foundation seed produced by the ICRISAT seed revolving fund. In the 2009/10 season NASFAM alone contracted 1,320 of its own members to produce certified seed, which it plans to sell through its own network of input shops. ICRISAT is also working with 30 agro dealers to produce and market certified groundnut seed through their own outlets. This decentralized model of production is a new innovation designed to reduce transport costs incurred when seed is collected and transported back to a centralized processing facility, and then re-distributed. Excessive handling of groundnut also results in loss of viability because the seed is fragile and easily damaged.

The availability of an assured supply of quality groundnuts of consistent quality is stimulating investment by commercial processors. Valid Nutrition has established a processing facility to manufacture ready to use therapeutic food using groundnut as one of the raw materials, and a similar operation is being developed in Kenya that will source

its groundnuts from Malawi. Improvements in quality resulting from a formalized seed system are stimulating innovation at several points along the value-chain.

Enhancing Capacity for Innovation: Learning from Practice
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Session 4: Enhancing capacities for innovation

Institutional and Organizational Outcomes

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The FIP-II project implemented in India and Nigeria has been experimenting with ways of enhancing fodder innovation capacity by promoting networking and institutional change among the different actors in the fodder-livestock context. Regular interaction [workshops, individual meeting, telephone conversations, attending other agencies meetings] and joint initiatives taken up by the networks created by the project led to improved communication among the different actors and it triggered several institutional and organizational changes. The changes varied from 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.

Demand for new research, technologies and knowledge

Demand for new research and technical support- Regular interactions among goat farmers, local government, state veterinary department, veterinary research institute, goat marketers and input suppliers at Ikire over a period of 18 months allowed goat farmers to assess the existing breeds and this led to the realization of the need for sourcing additional viable breeding stocks. Farmers have now started demanding researchers at ILRI and the government veterinary research institutes for supporting them in procuring or accessing better goat breeding stocks. JDPC is currently trying to get these goat breeding stocks and expertise for scientific breed improvement to support farmers for their successful transition to commercial goat production.

Demand for better fodder varieties- SG-2000 brought together a network comprising KNARDA, NACRBD, seed companies, crop-livestock farmers and fodder marketers to address this problem. To address the shortage of fertilizers and credit, the network linked farmers to KNARDA for fertilisers and NACRBD for loan. Workshops were conducted on dual purpose crops and ways of improving fodder quality and the farmers were also brought in touch with sources of seeds (NAPRI, IITA, Seed marketers, KNARDA extension agents) of drought tolerant and short maturing dual purpose crops (Ground nut- Samnut 23; Samnut 21l Maize- TZE Com-3DT and 95TZE-W; Sorghum-ICSV 400 &111; Cowpea-IT 288). Though these varieties were promoted in the same region 4 years back, there were not widely adopted. But now the same farmers are demanding these varieties for planting as they are getting other kinds of supporting services.

Demand for new knowledge- Interactions promoted by RAGACOVAS between the milk union, landless women livestock keepers and fodder entrepreneurs improved fodder supply, but not a commensurate demand for fodder mainly due to low price of milk and lack of conviction on the importance of feeding green fodder. Discussion on ways of reducing the cost of production of milk between milk producers and scientists led to close scrutiny of current feeding practices adopted by milk producers. The scientists offered better and cost effective rations with increased

use of cultivated fodder and the producers agreed to try these new rations. These interactions and trials led to demand from women SHGs for organised training on dairy cattle management. The training on dairy cattle management with special focus on feeding practices helped in reducing a lot of misconceptions on feeding prevalent among the livestock keepers and in ensuring more demand for cultivated fodder. While the same communities were reluctant to attend such trainings earlier, they are now demanding more number of such trainings to be organized for their benefit.

Improved governance and better delivery of services

Optimal use of extension staff- At Rago [Kano, Nigeria], three agencies of the government have extension agents in their staff, but due to lack of co-ordination among these agencies have led to a situation of overlapping of visits of these agents in some villages and lack of coverage in other locations. Through interaction and meeting with the different agencies [KNARDA. FADAMA III and LGA] and conducting joint visits to the locations, SG 2000 developed a new schedule of visits for uniform coverage and this has brought about better reach of extension agents. The organizations also made some adjustments to staff postings to ensure better coverage and reduce overlapping of EA visits.

Better delivery of services – In response to demand for vaccination of animals, the FES organized an animal vaccination camp in collaboration with other stakeholders [Department of Animal Husbandry and Bhilwara Dairy]. Use of existing networks for informing people about this event and wider collaboration of different agencies ensured better coverage of animals in the villages and efficient use of resources. It also acted as an opportunity for everyone to realize the importance of collaborative action.

New and reliable feedback loops for research

Being part of a new network with diverse partners, the Dryland Farming Research Station, Bhilwara, was able to reach a wider audience for testing and up-scaling some of the fodder varieties in farmer fields. Before this project, it was doing the testing with only few farmers in the nearby villages who were not providing a very honest feedback assuming that they won't get these new varieties, if they report some of the limitations of these tested varieties. Working in partnership with the wide range of actors, enabled the scientists to get more reliable feedback from more diverse locations

Mainstreaming a new approach to rural development and using it in other contexts

On realizing the merits of a capacity development approach for rural development by using the principles of the innovation systems approach, the FES organized training for its senior managers on Innovation Systems. FES is actively involved in planning and implementation of the National Livelihood Mission project at Bhilwara and it is using the learning from implementation of the FIP [networking, multi-stakeholder implementation, reflection, learning and re-adjustment of activities etc] in this new endeavour.

Organisations embracing new roles or entering into new forms of collaboration- Better understanding of the roles and capacities of each organization by others have led to development of new partnerships and collaboration. On realizing the activities and interests of JDPC, the Nigerian Veterinary Research Institute [NVRI] requested JDPC to collaborate with it on the African swine fever research programme

Conclusion

While these changes have led to better delivery of services and uptake of new knowledge, what is more interesting is the realization among the actors on the need for as well as importance of institutional and organizational changes and its potential contribution for promoting innovation.

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Session 4: Enhancing capacities for innovation

The research into use programme: exploring the relationship between agricultural research and innovation

Andy Hall

Context: Why Research on Research Into Use?

Debates about the use of agricultural research for innovation and development have reached an impasse. There is agreement on the understanding of innovation as "socially and economically significant new uses and combinations of ideas, technologies and research findings". There is agreement that research-derived ideas and information are just one source of inspiration in the innovation process. There is even agreement that this understanding of innovation requires the embedding of research in a network of partnerships and alliances that bring together various combinations of public private and civil society players — often described as an innovation system.

Where there is disagreement is over the question of the policy measures, approaches and patterns of partnership and roles of public and private sectors needed to achieve this embedding of research. Is it best achieved by promoting participatory, farmer first research approaches? Or should the market dictate the trajectory of innovation and the organisations involved? Is the role of the public sector to simply support research and its communication through extension? Or should it concentrate on providing the enabling environment for others to act? Will these networks and systems of innovation self-organise or do they need incentives and brokers to pull them together? And who should do this and how should it be financed? Are the public and NGO sectors the only agents that can promote innovation for the poor?

The answer is that there is no "one-size-fits-all" solution. Sometimes farmer-led innovation is important. Other times the private sector needs to take a lead. More often than not it is a combination of these two extremes, with the public sector playing a variety of roles, from facilitation to regulation and even service provision. Context, history and topic are all critical.

Research Design

The cornerstone of RIU's research design is the recognition that there is a diversity of ways of putting research into use for innovation and development. The research design employs 6 innovation narratives (see Box 1) as a framework for organising the evidence RIU collects about what approaches and patterns of partnership help put research into use and under what conditions. The lessons derived from the analysis of this evidence will help public policy and development practice choose appropriate research into use strategies for different innovation and development settings. This research will also identify research and innovation investment opportunities for both development organisations and the private sector, highlighting the patterns of partnership and

organisational and institutional formats needed to operationalise these for the benefit of poor people.

The RIU Experiments

The RIU experiments, while largely inherited, have some common features that support the research design. The first concerns the emphasis given to partnerships and alliances. This plays out in different ways across the experiments. In the Asia projects, networks of partners with a history of working together under DFID's earlier RNRRS (Renewable Natural Resources Research Strategy) programme have been expanded to address the impact at scale objective of RIU. The emphasis is partially about partnering beyond participatory approaches — for example, the Client-Orientated Breeding work is looking to work more closely with policy actors and government and private actors with a mandate for technology promotion and development. It is partially about partnering to strengthen communication of results — for example, the fish seed project in Bangladesh is working with partners that can help promote approaches that allow the wider distribution of genetically improved fish. Another take on this is partnering with micro-finance organisations to invest in rural innovation (for example the Roji Roti project).

In the Africa country programmes the emphasis has been on experimenting with brokering the emergence of networks around different research into use themes. The emphasis is, thus, on capacity development of innovation systems. In the Africa Best Bets the emphasis has been on building partnerships around the private sector business models that have relevance to poverty reduction.

The second common thread is about engagement of the private sector in the research into use and innovation process. Again, this has played out in different ways. The Africa Best Bets have taken the most explicitly private sector-led innovation approach, with projects mainly led by companies or, alternatively, development organisations employing market-based operating principles. The other facet of this is concerns the exploration of roles of the public and private sectors in financing these initiatives.

The Africa country programmes have engaged the private sector as one of a number of players needed to address rural development opportunities and challenges. In some cases, such as the poultry development initiative in Tanzania, the private sector has taken the lead. In others, such as the promotion of cow pea and soybean in Northern Nigeria, the private sector has taken on more of a service/ backstopping role.

In many of the Asian projects the private sector has been one of a number of actors involved. For example, in the flood plain management project in Bangladesh civil society organisations have been much more prominent, with the private sector being more an interested stakeholder than a driver of innovation. In contrast the participatory plant breeding projects has set up different types of private sector organisations to enable research into use and innovation. In the cluster of projects dealing with research into use and innovation in the value chain the approach has been to engage entrepreneurs and companies involved in linking farmers to inputs and output markets. Two projects have

partnered with an NGO, IDE (International Development Enterprises), which uses market system development as a way of delivering services and products to the poor.

Selected Research Highlights and Preliminary Lessons

Who champions putting research into use?
A common feature of research under RNRRS was that while it was successful in developing innovative approaches — to plant breeding, marketing systems development for the poor, animal disease/ crop pest management and migratory pest control, for example — these approaches struggled to displace existing approaches. Institutionalisation just did not take place.

RIU's Client Orientated Breeding cluster is a good example of this. A large number of varieties have been developed and there is a substantial body of peer-reviewed evidence endorsing the value of this approach. Yet uptake has been weak in both national and international agricultural research organisations. This contrasts with the relatively successful spread of comparable suites of new approaches, such as the System of Rice Intensification (SRI). In the case of SRI champions have emerged who have been able to navigate complex political and institutional landscapes, building networks of practitioners and policy actors willing to advocate and promote the approach.

This raises questions about the limits to the usefulness of scientific champions (usually research leaders on earlier research) in getting research into use. Examples from the RIU Africa programmes also hint at these same limits and provide evidence that suggests that a different kind of champion may be necessary at the research into use stage of the innovation trajectory.

This is probably a champion with: limited ownership of the research; a stronger ownership of outcomes; and strong networks with policy and entrepreneurial actors. The champion may work in a private company. For example, the feed milling industry has championed trade policy advocacy in support of the RIU cowpea and soybean platform as it is in its interest to restrict the import of cheap oils that make soybean milling uncompetitive. Alternatively champions may have an interest in pursuing wider goals. For example, in Uganda a university dean is developing an employment scheme for graduates by championing RIU's sleeping sickness control approach as this provide employment for veterinary school graduates.

Although these finding are preliminary, a clear implication is that for research to be put into use, creative ways need to be found to transit from scientific champions to innovation champions who have the incentives to make change happen. Understanding the motivations of champions under different circumstance will help develop better ways to deploy championing as an RIU strategy.

Bottom-up Bottomline Business Models and the Role of Development-Relevant Enterprises

Over the last 10 years much has been written about the role of the private sector as part of a more widely-conceived notion of agricultural sector capacity for innovation and development. Can this really happen and what is its role in putting research into use? An analysis of RIU's Africa Best Bets (see Hall, Clark and Frost 2010) suggests the emergence of a new class of private enterprises in East Africa that would appear to be able to fulfil this role. These organisations occupy a niche that sits between the mainstream for-profit enterprises and the developmental activities of government programmes, NGOs and development projects. This type of enterprise activity is not corporate social responsibility, but an altogether new type of business model that is blending entrepreneurial skills and perspectives with mission statements that seek to serve the needs of poor customers and their welfare. The ethos is both bottom-up and bottomline. Hall et al (2010) classify these organisations as Development-Relevant Enterprises (DevREs).

Examples include:

- Companies that initially emerged to service the large-scale horticultural sector's need for bio-control pest management approaches that conform to European market regulation. These companies now target small-scale farmers' needs for bio-control agents to combat Striga (a parasitic weed of the food staple crop maize) and the migratory pest army worm.
- Another organisation acts as a go-between negotiating access to new crop varieties developed by national agricultural research organisations. It also works with input supply companies, persuading them to produce micro-seed and fertiliser packs that small farmers can afford.
- Another company has established a multimedia platform (print, internet and radio) to communicate with Kenyan youth and is using this to sell advertising for soft drinks and mobile phone companies as well as raising revenue from development agencies for communicating agricultural development messages.
- There is also an initiative established as a spin-off from a University that is establishing a network of veterinary services aimed at creating self-employment opportunities for recent graduates and diploma holders and, in the process, propagating a novel approach to treating sleeping sickness by eradicating the parasite in livestock rather than insect vector control.

These organisations are notable for three characteristics.

- The first is the provision of services and supply of inputs using market-based principles and relying on revenue from either the poor themselves or the government and development assistance, but usually a combination of the two.
- The second is that services provided are often of an intermediary nature, helping bridge gaps and broker relationships with other players in the innovation system. Alternatively these enterprises are operating as part of a wider coalition of private sector and development partners, with champion organisations stepping forward to facilitate the connections needed to mobilise expertise and resources to tackle complex societal issues at the interface of public and private responsibility and interests (for example, migratory pest control).

- Thirdly, these enterprises often involve establishing rural networks of advisers/ experts/ para-workers with an explicit agenda of employment generation for both rural youth as well as degree and certificate holders.

This preliminary analysis suggests that within the vast diversity of private sector activity in East Africa a range of new business models and organisational formats are emerging which, if properly understood and appropriately nurtured, could make an important contribution to innovation-driven sector development and associated welfare gains.

A clear implication of RIU's experimentation is that the use of public sector funds to kickstart or expand the businesses of DevREs is justified in terms of the poverty reduction paybacks this offers. The next challenge for RIU is to understand what mix of public grants and private investment could exploit bottom-up bottom-line business for innovation and development on a much wider front.

Brokering Networks for Innovation: Who and How?

It is now widely recognised that the deployment of research for innovation and development requires a capacity development approach, which involves making better links among a variety of producers and users of information as well as introducing new ways of working to help make those links effective. This, however, begs the question of how this linking up should take place. Are these self-organising networks? Or does it require an organisation to specifically play this role? And, if so, who should this be? All of RIU's experiments demonstrate different forms of brokering, although the Africa country programmes offer perhaps the most obvious examples because of their explicit capacity development agenda.

The experience from RIU's Africa work points very clearly to the fact that there is currently a missing piece of architecture in African agricultural innovation systems. The success of RIU's Africa country programmes is largely because these have been able to fill this gap by brokering alliances around different topics. For example, the broking role of RIU's Nigeria office in supporting the packaging of cowpea seed will impact on 5 million people in 2 years! Some of the Africa country programmes are run by private companies, while others are offices within agricultural ministries or research councils. This suggest that it is not the type of organisation that is important, but rather its role of building links and removing bottlenecks to alliances that is critical in putting research into use.

It is important to recognise that this brokering role is very different from the role of extension, which was focused on information transfer. Brokering involves finding ways of negotiating working relationships. In the African Best Bets businesses such as Real IMP and FIPS use brokering as a way bringing in partners with services and products that it needs. In the case of the control of army worm, an international organisation has brokered the alliances needed to address a public good concern that needs private sector assistance.

In RIU's Asia projects the format of brokering is quite different. Here the projects have emerged out of an expansion of an earlier series of research projects conducted over many years. As the projects became more impact-focused over time, developmental and private partners became more numerous. This has created a hybrid type of project that looks very much like a traditional development project, but which retains a research and innovation agenda rarely seen in mainstream rural development projects in the region. The function of the project as an intervention has thus shifted from a role of managing research quality, to a role of brokering the partnerships needed for innovation and impact.

This initial analysis of brokering in the RIU underlines the importance of this role and its value in building the capacity to generate impact from research and innovation. It also suggests that while this role can be played by either public or private sector organisations, the market rarely pays for this roles (unless it is in the interest of a specific company to play this role) and that it will usually need to be supported by public funds. RIU's experiments illustrate a number of ways in which public investment can be used to support brokering — it could establish or fund existing organisations to play this role; it could identify companies that broker as part of their business model and support them to expand this role; it could support impact-oriented, mission research and innovation consortia that add value to specific elements of long-term research trajectories.

Next steps for RIU's research.

Preliminary analysis of RIU's experiments is starting to point to the how, who and where of putting research into use for innovation. In the coming year CRT will focus its attention on building a dialogue with its target audiences in the public and private sectors to share findings and perspectives.

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Session 5: Strengthening networks

Nurturing networks: A reflection

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Building networks with appropriate configurations of stakeholders was designed as the critical first step in enhancing innovation capacity of livestock systems. Different activities were implemented by the Key Partner Organizations (KPO) to build these networks. The project team provided need-based mentoring support for KPOs during this process. This paper describes the process and reflections thereof.

Patterns of network dynamics and their potential for working towards predetermined goals

Networks of different agencies exist in both rural India and Nigeria. Depending on the interest of champions in these networks they are aligned to different objectives - some developmental, some business and trading, some associated with political and personal advancement. Generally speaking, the Indian rural landscape is quite crowed with GOs and NGOs. The private sector activity is also relatively well developed. In contrast, the Nigerian landscape is sparsely populated, particularly the NGO sector; and private enterprises concentrate mainly along traditional commodity trading lines. Both countries have institutional settings that tend not to facilitate collaboration between different types of agencies, despite supporting intentions at the policy levels. Certainly in the case of India, policy measures to encourage joint action at various levels in the agricultural sector have developed. While the landscape and dynamics of these networks in the two countries are qualitatively different, they both offer the potential for strengthening and nurturing them around selected developmental themes. A detailed analysis of these institutional settings was undertaken by the project.

KPO action in FIP

As a first step, the KPOs organised a series of workshops with diverse agencies associated with livestock sector to jointly review relevant issues with the objective of creating informal and loose networks. These were mainly informal with KPOs using their existing contacts. A theme for action research was jointly identified in each of the areas by the agencies, to build networks around. These themes tended to be broad, but focused on livestock issues including fodder (See Box 1 for the themes). These agencies then identified options for action and agreed on the role to be played by each of them. After this stage, each of the KPOs adopted different and locally relevant approaches to strengthen these informal networks. These involved understanding of habits and practices of each of the agencies and approaching them based on that knowledge. Some of these included engaging with certain agencies through official channels, using personal good offices with few other agencies, dealing with personal egos, etc. Some times simple things such as arranging transportation for certain agencies to go to the field locations, allowing some agencies to take leadership in discussions, sensitivity to controversial issues between certain agencies and avoiding them during discussions, etc. played an important role in bringing different network members into the fold and building rapport.

Box 1. Research Themes

- Puducherry, India - An experiment in establishing an integrated fodder production and marketing system based on farmer fodder entrepreneurs.
- Bhilwara, Rajasthan, India - An experiment in developing a mechanism to coordinate complimentary technical (including fodder) and institutional support in order to upgrade smallholder dairy systems.
- Ahmednagar, Maharashtra, 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.
- Ikire, Osun State, Nigeria - An experiment in connecting and coordinating existing systems (markets, religious / ethic groups, technical support, policy and traditional institutions) to facilitate the transition from subsistence to commercial goat production.
- Dambatta, Makoda and Rogo, Kano state, Nigeria - An experiment in connecting and coordinating existing systems (markets, religious / ethic groups, technical support, policy and traditional institutions) in order to address seasonal fodder shortages in mixed crop livestock systems

After building initial rapport and buying-in support from relevant agencies, the next stage was moving to action in the field. Specific and implementable activities, for each of the themes, were chosen as the starting points. These activities needed different combinations of agencies to work together for implementation (See Table 1 for initial sets of activities and clusters of agencies to implement them). Relevant agencies voluntarily formed the clusters and implemented the activities, while they were monitored at the network level.

Table 1. Example of clusters of agencies implementing the initial set of activities

S.No.	*Project Site*	*Initial set of activities*	*Cluster of types of agencies implementing the activities*
1	Bhilwara	Vaccination for animals	NGO, Animal husbandry dept. and Cooperative dairy
2	Ahmed Nagar	Fodder production and use from forest areas	Forest department, NGO, JFM, Village panchayat, Agriculture University
3	Puducherry	Fodder production in private lands	Social forestry department, NGO, village community
4	Rogo	Re-organizing agriculture extension services in rural areas to ensure uniform coverage and avoid duplication	NGO, different extension services providers
5	Dambatta	Accessing credit by farmers	NGO, villagers, banks
6.	Ikire	Linking goat farmers to markets	NGO, villagers, goat traders, local govt. extension officer

Another common feature among all the network building efforts was to ensure that individual agency's mandates were met, so that they retained interest and commitment for achieving the network objectives. The following cases support these arguments.

- The case of vaccination for animals through a collaborative action in Bhilwara project location shows how the regular mandate of the animal husbandry department was achieved more effectively. The cooperative dairy, associated with this activity had its own mandate achieved as improved health of animals meant better productivity. While associated with this activity, they promoted their services among villagers and gained their confidence. As a result their milk procurement from the area improved significantly. The NGO had its rural development mandates achieved, more comprehensively.
- When goat farmers in Ikire were proposed to be linked to the markets, they were organized into self help groups and in the process, agencies such as traders, villagers, govt. extension department volunteered to come together as a cluster within the network to see through this activity. When this was achieved all participating agencies got their specific needs fulfilled with farmers accessing markets for better price, traders accessing produce of their choice, extension department easily achieving its targets through organized primary stakeholders and, the NGO achieving its developmental goals more effectively.

The effort by KPOs was essentially about facilitating a negotiation process that resulted in collation of individual agency's agendas to contribute to addressing the development challenge in consideration and shaping the network accordingly. This negotiation process was flexible and specific to local requirements, which is evident in different types of entry point activities in different networks and different compositions of networks.

The non-fodder activity entry points (Table 1), though the project was originally commissioned to address fodder scarcity issues, suggests that most often the network agenda is determined by the existing demands of the network actors. The facilitators of the network building initiatives need to be patient and flexible, and allow such manifestations as they all contribute for strengthening networks, through enhanced interactions and linkages among members. While carefully monitoring such developments of networks, necessary negotiations need to be undertaken at appropriate times to achieve the original objectives. The following examples illustrate this.

- In the case of Dambatta and Makoda sites, the initial set of network activities was about facilitating access to credit by local farmers. While this was achieved, the KPO used the linkages built with different agencies to negotiate for action to reclaim the encroached grazing lands, which was a demand from the villagers and a requirement to address fodder shortages. The 'network capital' created during the first set of activities not only ensured that it was achieved; but as a follow-up bore-holes were dug in the retrieved lands to enhance the availability of water for livestock.
- Vaccination for animals was the initial set of activities in Bhilwara. However, a severe drought during the second year created severe shortages of fodder. During this period, the network partners re-oriented their activities to include restricting fodder transportation out of the area, just before summer season to ensure its availability for local consumption. This process involved sharing of information by different members with the rest of the network and using different sets of knowledge from members to explore options.

The project experiences from Puducherry indicate that in some cases unique situations exist among agencies participating in the network, which require fewer interventions to motivate joint action. The facilitating agency's (in this case a reputed extension department of a veterinary

university) unique status/position among its network members and/or a culture of working together could be the possible reasons for this situation.

Jointly analysing the problem, identifying solutions, implementing those solutions and monitoring provided the participating members of the networks an opportunity for experiential learning about usefulness of working together. They realized that through this, there is pooling of resources (both human and financial) from respective agencies and programmes and effective implementation of activities. The following examples support this reflection.

- Exchange of information among members in the network, promoted by SG2000 in Kano, showed that there was duplication of extension support services in few villages by different providers (KNARDA/SG 2000, funded by state & NGO; LGA Agric. Department, funded by local authorizes; and FADAMA III, funded by Federal/state), while others villagers were not covered by any of those agencies. This realization and sharing of information among network members resulted in reorganizing of their staff and their visit plans and ensuring uniform coverage of all the villages in the region.
- In Bhilwara, the Animal Husbandry department's (AHD) regular vaccination programme through door-to-door approach usually covered about 90 animals in a day. When they organized vaccination camps in collaboration with FES and Bhilwara dairy, they could cover about 900 animals in a day, due to increased awareness of livestock keepers about benefits of vaccination, who organized to bring their livestock together in an area for the AHD to administer the vaccines. These three agencies were complementing each other with their unique skills - locally existing social organizational skills of FES; cooperative dairy's knowledge about usefulness of vaccination; veterinary knowledge and availability of vaccines from AHD.

After implementing the first set of activities, there was increased trust and confidence among different agencies. The improved feedback and information flow mechanisms, created through these networks of diverse agencies, have started spinning off further networks. Some unusual partnerships started to emerge. The following examples substantiate these observations.

- The researcher from the NARS in Bhilwara, Rajasthan shared during the Internal Reflection Meetings that their embedding in the network helped them to receive 'honest feedback' from farmers and other agencies about their research technologies. This was useful to plan relevant research activities. It was felt that increased trust among them resulted in improved feedback mechanisms.
- The network promoted by WOTR in Ahmednagar for addressing fodder shortages during drought situations, manifested in further networks with different sets of agencies and agendas to address local problems.
- While working as part of the same network, a new collaboration got initiated between JDPC and the National Veterinary Research Institute (NVRI), for supplying vaccines for the African swine fever.
- By observing the performance of the network and identifying an opportunity, a charitable 'goshala' owner volunteered to join the network promoted by RAGACOVAS in Puducherry to support the initiative and benefit his organization through the network activities by accessing fodder for stray animals given shelter in the goshala.

These realizations about multiple benefits of working in networks have further strengthened linkages among them. In the whole process, the KPOs played a crucial role by understanding

emerging situations, and devising and implementing relevant strategies to strengthen linkages among the network partners.

The project experience shows that network building happens with individuals from different agencies, who have sympathy towards KPO's agenda. In all the cases, KPO representative's existing personal contacts with different individuals were used to initiate the network building. In some cases, KPOs organizational reputation came in handy. However, as most are personal contacts, when these individuals leave the area (e.g., through transfers in GOs), as seen in the case of WOTR, FES and RAGACOVAS, the KPO need to begin fresh interventions to bring the replacing individuals on board and into the networks. This shows that network building is a continuous process and the champion agency needs to apply relevant strategies continuously, until the relationship and practice of working together is institutionalized or becomes a routine in the organization.

Project's mentoring support for KPOs:

The project team engaged with the KPOs and supported them to re-orient towards shaping and strengthening networks of diverse actors to address identified issues. This was a departure from their conventional approach of implementing solutions by themselves or in consultation with relevant organizations, by linking with them unilaterally. This reorientation was supported through a series of interactions during the project period, which included–

- 'Levelling workshops', where a common understanding of the project conceptualization was achieved through a series of experiential learning exercises
- 'Induction workshop', where specific and real-life cases were used to facilitate understanding of ways of developing innovation capacity of agricultural systems
- Periodic reflection opportunities for KPO functionaries with the project team members and among themselves, about the activities undertaken by them in their respective areas. These were achieved through discussions during field visits by the project team members to KPO locations, Quarterly review meetings in KPO locations, Internal research symposia and Internal reflection meetings at each of the KPO locations by involving their respective stakeholders.

Throughout the interaction, prescription of specific activities was consciously avoided. The discussions focused on understanding field level happenings from a network building perspective.

All these interactions resulted in enhanced skills of KPOs in strengthening networks. They had necessary skills to facilitate networks, but they needed some re-orientation to pay attention towards habits and practices of different stakeholders and strategies to deal with them to build networks. In essence, the effort was on re-orienting them from finding solutions themselves to building networks with diverse stakeholders to find solutions.

Conclusions and implications

Multi-agency networks exist in India and Nigeria, guided by interests of their respective champions. Nurturing networks and shaping them to address pre-determined issues is possible, but there are no blueprints for doing that. This dynamic process requires an agency which is embedded in that system with necessary negotiation skills and creativity to bridge gaps among relevant agencies to create a common agenda. They may need to use a wide variety of formal and informal ways and incentives to motivate the network members and keep them engaged for achieving the set goals. They need to have patience and flexibility to allow modifications to the original agenda by the network members and have different entry points, but negotiate at

appropriate moments to focus to achieve the original objectives. Network building is initially facilitated through exploiting champion agency's personal contacts and reputation. It tends to be a continuous process as network membership and challenges being addressed evolve.

Enhancing Capacity for Innovation: Learning from Practice

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Session 5: Strengthening networks

Innovation Brokerage in Disconnected Systems

Elias Madzudzo

Introduction

The FIP's point of departure was the idea that developing innovation capacity can drive rural change and that developing this capacity involves making better links among a variety of producers and users of information as well as introducing new ways of working to help make those links effective. This, however, begs the question of how this linking up should take place. Are these self-organising networks? Or does it require an organisation to specifically play this role? Evidence from FIP has highlighted the critical importance of a brokering role, and illustrates both the nature of this role and the types of organisation that can play it. Critically it is a role that involves intermediation between different organizations in emergent innovation systems, building and negotiating relationships between these organizations and ensuring that this collective capacity to innovate operates effectively.

1. Building and negotiating relationships

SG2000 approached the fodder problem in Kano through building relationships among between the crop livestock farmers and the Nigerian Agricultural and Rural Cooperatives Development Bank (NACRDB). Although the NARCDB had been in existence from the 1970 s it had largely been patronized by the richer farmers. The bank management noted that prior to the interactions facilitated by SG2000 they were only used to working with better resourced farmers than the current group SG2000 was negating for. The farmers on the other hand, though some were aware of its existence lacked the means to access its services. In this case the SG2000 coordinator introduced the bank management to the farmers and over time established rapport between them. In the end the farmers were able to apply for loans from the bank. The farmers were required to form cooperatives and collectively apply for the loans. The SG2000 innovation coordinator linked the farmers to the state Ministry of Cooperatives for the registration of the cooperatives. The bank also expected the farmers to have open accounts with the bank through which the loans could be disbursed. The innovation coordinator had to go to each of the five cooperatives to encourage them to put together the funds required by the bank, to speed up the loan application. After submitting the loan application the other hand the innovation coordinator visited the bank frequently to check on the progress of the loan application and kept the farmers aware of the latest developments.

2. Ensuring the collective capacity to innovate operates effectively and accessing resources

JDPC linked the goat farmers in Osun State to organizations like the State Agricultural Development Project and Fadama III rural development project. Initially, these organizations felt that they were assisting JDPC meet its own objectives. JDPC argued that these bringing all the actors to a platform was meant for the collective benefit of all

involved. For instance the other organizations were now better positioned to address their mandates because they were working organized farmers in one place. JDPC reinforced the relationships by facilitating visits by the farmers to Fadama III offices. The outcome was that the Fadama III officials included the Osun farmers to the food security project funds.

3. Brokering institutional change in the value chain

In Osun state JDPC promoted interaction between on one hand goat farmers and marketers and on the other goat farmers and the NVRI. Goat farmers have always accused goat marketers of underpaying them for their goats. Yet the marketers were critical for the proposed transition from subsistence to semi commercial production. JDPC brought the goat farmers and the marketers together to explore ways working together. In the end the marketers were offering to assist the farmers with loans and advice on the breeds to best suited for commercial production. Even when the farmers hesitated to work closely with the marketers, the latter went out of their way to visit the farmers in their villages to give advice on production.

In another case the Nigerian Veterinary Research Institute (NVRI) did not interact with the farmers because resource constraints as well as suspicions of quackery among farmers. JDPC brought the farmers and the NVRI together in meetings to discuss animal health matters. With increased interaction at meetings the NVRI ended up participating in vaccination camps and training the farmers as village based animal health specialists.

4. Brokering as Conflict Resolution

Encroachment of grazing areas and stock routes by crop farmers is a common and yet intractable challenge in pastoral areas and particularly in Kano State. SG2000 linked the traditional leaders, local government to the livestock farmers that had lost their grazing lands to crop farmers. These linkages allowed the livestock farmers to present their problems to higher offices where they had no access in the past. With the persistence of the SG2000 over six months the District Head assisted the pastoralists reclaim encroached grazing land opening opportunities for research organization like NAPRI and development the Ministry of Community Development to assist in the rehabilitation of the grazing lands.

5. **Access to resources**

This is a case study that contrasts JDPC from SH2000. It shows that while the lattere used its status as a big NGO the former had to resort to tacit knowledge about actor aspirations within the network. In the end the farmers in Osun bebefitted from the Fadama III programme targeted at poor farmers. The case study is used to demonstrate that when thinking about brokerage roles it is the function than the form of nature of the organization that is critical. This is key point in policy formulation. Below policy implication of the case studies are addressed.

IMPLICATIONS FOR POLICY

6. Policy towards brokering organisations?

The activities and changes that have come about as a result of SG2000 and JDPC's activities show that brokering is critical for improving linkages among producers and users of information and changing ways of working to make the linkages effective. At the same time the case studies show that the brokering organizations or actors that play this role are missing from rural innovation systems. The implications for public policy is that the resources need to be invested in those organisations that have the capacity to perform these roles. This brings us to the second point, what are these organisations like?

7. Who is best positioned to perform brokering roles?

Case studies of SG2000 and JDPC show that the value of their brokering roles lies in their skills to link different actors and to promote the habits and practices that lead to the strengthening of networks they formed. Also the studies show that SG2000 and JDPC have almost represent two ends of a spectrum; a big hybrid international NGO and a small faith based organisation. Yet both organisations perform the same functions because of their capacity to strengthen linkages among a state and non state actors. The evidence from the FIP case studies then suggests that the types of organisations who can play brokering role are diverse. What is critical is to identify those organisations that have the skills to perform the boundary work *vis a vis* the innovation capacity challenges.

8. What does brokering comprise?

Brokering is multidimensional comprising *inter alia* demand articulation, coordinating services and needs of actors, conflicting resolution and negotiating access to resources. This diversity of roles suggest that a key property is the ability to negotiate dynamic relationships with relevant stakeholders than an organisation'

Enhancing Capacity for Innovation: Learning from Practice
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Session 6: Who does what and for who?

Does building networks help the poor and how??

Ranjitha Puskur, Vamsidhar Reddy

Most research and development initiatives set out with the objective of achieving 'pro-poor' outcomes and impacts. How many projects achieve pro-poor outcomes? How do we define and target the poor and vulnerable in the rural systems in which we work? Does working with the poor mean we exclude everyone else?? This is a challenge which most R4D initiatives face and the Fodder Innovation Project is no exception.

Poverty is a context specific issue and same criteria for classifying rural populations cannot be applied across different geographical regions and communities. Poverty can also be seasonal in some cases. Generally, sections of rural populations which live in marginal environments, have limited resources (social, natural, physical, financial and human capitals) and, therefore have a limited capacity to respond to emerging challenges and opportunities are considered poor. This paper describes the strategy followed by FIP in making it's efforts poor.

Working with a network of agencies with a pro-poor agenda

The project chose agencies which had an explicit pro-poor agenda as partners for the implementation of the project. 'Poverty and equity relevance of the *ag*enda and activities of the partner organisation' was one of the criteria used during the landscaping study employed to narrow down choices of partners. The project attempted to enhance performance of different agencies through establishing networks and information sharing mechanisms, so that collective action of relevant R&D agencies would create synergies through drawing on each other's capabilities, competencies and resources. This was expected to result in better service delivery to the communities, not necessarily only to the poor, and address continuously emerging problems through enhanced response capacity of the system.

This paper describes cases from the Project which illustrate how this strategy played out during the implementation.

Case 1. Improved access for poor to livestock services in Bhilwara

The Project interventions in Bhilwara started with building a loose network of agencies connected with the livestock sector, and strengthening linkages and working relationships among them. As part of this effort, different agencies collaborated in different combinations to deliver their mandates. The Animal Husbandry department (AHD) collaborated with FES and Bhilwara dairy to implement their vaccination programme; while the local ICAR station collaborated with FES and Bhilwara dairy to implement their research and outreach activities. The FES leveraged their relationships with many agencies of the network to implement their rural development initiatives. Due to such collaborative efforts, vaccination programme covered ten times more animals in the target villages in a given period, in comparison to AHD's regular programme; different fodder species options available with the ICAR station were tested in the villagers' fields and provided access for; and the rural development initiatives of FES were implemented with enhanced multi-disciplinary contributions addressing diverse problems. The cooperative dairy increased its

support services in the target villages and as a result improved its milk procurement from those villages.

Implementation of vaccination with enhanced efficiency (creation of awareness about benefits of vaccination, organizing animals together for vaccination, etc.) benefited poor communities, as the whole village was covered. The cooperative dairy's enhanced outreach of their services to the villagers helped poor communities to benefit from them. Fodder species options from the ICAR institute reached the villagers at their door-step and helped poor communities to access them. On the whole, the NGO with pro-poor objectives needed to negotiate for focus on the poor and ways of involving them.

When FES together with the network actors, embarked on developing pasture lands on 518 ha under NREGA and augment water availability, it put systems in place to ensure that benefit sharing in terms of the fodder and water remains pro-poor and also to ensure the rightful representation of the poor in the decision-making processes at the village level.

In addition, FES was requested to contribute to the planning of the pilot National Rural Livelihoods Mission in 101 villages in the district with a focus on the 'Below Poverty Level' households. With the experience of working on the fodder innovation systems for over a year and having a group of 4 actors namely the Bhilwara dairy, Animal husbandry department, ICAR's dry-land research station and BAIF also being involved in the planning process, it was imperative that the idea of innovation system was proposed as a way of working towards meeting the overall goal. The collective presentation made on the how the group has been successful in implementing joint action plans developed with the communities to address the livestock issues was very powerful in grounding the concepts of innovation systems in the forum. The ideas were well taken during district level meetings and discussions with officials from Government of India, which generated a spirit that the convergence of programs as well as agencies is must if we want to eradicate poverty.

Case 2. Benefits to poor through linking to credit services and enhanced local governance in Rogo

SG2000 in Nigeria, as a priority activity decided to address the problem of accessing credit by farmers', especially the resource poor who were in their target group. The NGO, the local government functionary, the Bank, farmers' groups and the local agriculture extension department joined together and made necessary interventions to tackle this with a focus on the poor.

Reclaiming encroached grazing lands was another element in the joint action plan of the network. The local government functionary, the NGO and local community members joined forces to address this issue. Though there were national policies supporting this, a concerted action by different agencies at the local level was required. Access to communal grazing reserves and water sources directly helped poor to access them.

Another joint intervention by the network was to reorganize agriculture extension services provided by different agencies, and this helped uniform distribution and coverage of all the villages of the region with the technical support. . This availability of services at the village level increased the possibilities of poor having access to those services.

Case 3. Improved access to fodder by poor community members in Ahmednagar

The network of diverse agencies, promoted by WOTR as part of the Project, embarked on increasing fodder production in public and private lands. The Forestry department, the local agriculture college, the Joint forest management committee of the target village and NGO joined

hands to promote fodder production in the local forest lands. While implementing this activity, WOTR together with the community worked out a pro-poor mechanism to share the benefits from the reseeded land. As per these norms, the first right to cut/harvest grass from the land is given to the landless poor livestock keepers, followed by marginal farmers, then farmers who do not have land for fodder cultivation, farmers who do not have irrigation facility and, then the better off farmers.

Case 4. Access to fodder by landless livestock keepers in Puducherry

The multi-agency network in Puducherry embarked on testing models to develop a green fodder production and distribution system by involving the cooperative dairy, AHD, fodder growers, fodder buyers, agriculture department and the local veterinary college. Establishment of a proper transaction channel for this resulted in a system with resourced farmers producing fodder on their agricultural lands and providing it to landless livestock farmers belonging to women SHGs with mediation by the cooperative dairy's milk collection centres at the village level. This was a win-win situation, where landless livestock keepers are able to access good quality fodder and fodder cultivators are involved in a more remunerative enterprise. Encouraged by the success, some women SHG members, who are poor landless villagers leased-in land and started producing fodder as an income generation activity.

Case 5. Access to markets for poor goat farmers in Osun state

The network of diverse agencies, promoted by JDPC, planned to create access to markets for goat farmers. Their interventions brought goat farmers and traders together, mediated by the NGO. The goat farmers, organized in groups and consisting mostly of poor community members, had the negotiation power to deal with traders and get better prices for their animals. The network interventions are also creating access to better breeds for these goat farmers' groups and resulting in better goat management practices through capacity building.

Conclusions: pro-poor characteristics of innovation capacity building efforts

These experiences show that if an initiative has pro-poor objectives, it does not necessarily imply that they work exclusively with the poor. In fact, it might be important to work with some of the non-poor who provide services and, are embedded in relevant networks and who bring in the non-financial capitals, so that poor also benefit through these linkages. If carefully orchestrated, the personal interests of the non-poor can be accommodated to complement the pro-poor efforts.

Building networks with diverse agencies can lead to enhanced efficiency in delivery of mandates of various agencies to support communities. However, a general improvement in the service delivery does not necessarily guarantee access to the poor and this has to be negotiated by champions in the network, as illustrated in some of the cases.

Enhancing Capacity for Innovation: Learning from Practice

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Session 7: Enabling environment and Learning

Locating fodder science, technology and innovation in rural development

Rasheed Sulaiman V and Andy Hall

Introduction

One of the recommendations of the Fodder Innovation Policy Working Group [FIPWG] constituted by FIP-II in India, was to widen the evidence base of the project, by looking at two apparently successful cases of fodder innovation. These cases were selected by the Chairman, NDDB because both were rather paradoxical and their success seemed counter intuitive. The first is the case of the Banas dairy which is achieving one of the highest milk procurement in India with apparently plentiful fodder, yet was operating in an area of very low [200 mm] and unreliable rainfall, with poor soils and low levels of literacy among farmers. The second is the case of the work of Seva Mandir, a broad based development focussed civil society organisation which has had neither a focus on fodder or on livestock, but through its work on developing village institutions to protect and develop common property resources in combination will a number of innovations in forest management policy drastically changed the availability of fodder. These cases have been explored to understand two key aspects. Firstly, the processes of innovation that took place and how fodder innovation is located in the wider arena of innovation and secondly, how scientific research and research derived technologies have mapped on to these innovation processes and contributed to the positive changes that have been witnessed.

Banas Dairy

Banas Dairy, [Banaskantha District Co-operative Milk Producers Union], was established in 1969 as a network of eight village level cooperative milk societies in two talukas of Banaskantha District of Gujarat. Under "Operation Flood|" implemented by NDDB, a dairy plant was established in 1971. Till 1990, the organisations had poor procurement. However, from 1991, the dairy made steady improvement in all aspects, From 200,000 litres of milk per day in 1991, the dairy is currently processing more than 1 million litres of milk per day making it one of the most productive milk unions in India. This is despite a topography that is harsh, arid in some pockets and semi-arid in others.

Several reasons contributed to the success of the dairy, the most important being the good and timely returns to farmers. In the last two decades the price of milk has almost doubled, from Rs. 11 a litre to Rs.22 a litre. With long term decline in rainfall, agriculture is not a very good option in almost all parts of the district. Initially the inhabitants of Banaskantha considered livestock as a supplementary activity to agriculture. However in the past 5-6 years, the livestock farming has become the major activity. Farmers are also switching from crop production to dairy production given the short-term cash flow and

stable income from it. In the earlier years, people with less means of irrigation would still try to grow crops. Nowadays, they are growing fodder crops instead of food-grains or oil seeds.

The milk co-operative society is present in almost all villages. A total of 1351 milk societies exist to cater to the 1381 revenue villages in Banaskantha. The dairy has undertaken several programmes to improve the production and productivity of animals. These include: promotion of technologies like artificial insemination [through 500 AI centres]; training programmes on clean milk production; establishment of bulk milk chilling units [600, the highest in any district in India]; provision of veterinary support to producers mainly through the 13 veterinary centres operated at the taluka level; organisation of infertility camps, mass-de-worming programmes and supply of cattle feed at no loss no profit basis. As part of the integrated dairy development programmes of the state government of Gujarat, the Dairy is providing financial assistance to poor tribal communities inhabiting its two talukas for purchase of cow and buffalo.

Since 1999, the dairy is implementing an internal consultant development programme to prepare the milk co-operative societies for taking up total quality management and this includes trainings on different aspects of dairy management- cleanliness, improvement in AI services, visioning [development of vision-mission strategy], use of testing devices, leadership, feeding practices etc. All field veterinarians and supervisors would function in the capacity of consultants in their respective areas of operation. More than 700 societies have been covered under the vision mission strategy. To develop good will and to strengthen its relationship with producers, the dairy is also organising blood donation camps, heart camps, tree planting etc.

Except promotion of fodder, the dairy has almost done everything possible to increase production and productivity of livestock. Key to the success of this model has been the emphasis on building relationship with producers and ensuring their loyalty and trust. The majority of innovations have been on welfare support, marketing support and technical support mainly on health and breeding. The number of improved and healthy animals has increased over the years due to a number of supportive measures taken by the dairy and this has increased the demand for fodder. Fortunately a functioning fodder market emerged in response to the increasing demand for fodder [Box 1]

Box 1: Fodder scene at Banaskantha

Growing fodder has become a lucrative option as a crop and some farmers now exclusively grow fodder. Big farmers in water rich talukas having large tracks of land with irrigation cultivate fodder crops, store and sell fodder in water scarce months. Farmers in water scarce region which are totally dependent on the monsoon for water sell the excess fodder [husk of bajra and jowar] at good margins to dairy farmers in the adjoining talukas. In Banaskantha, fodder requirements are met from green fodder [mostly *Rajka Bajri* grown in the months of monsoon], dry fodder obtained from drying green fodder and agricultural residues like husk from bajra, maize, jowar etc, Oats and chikori are grown during winter. However, except of a couple of drought years in the last couple of decades there has not been an acute shortage of fodder overall. There are

incidents of seasonal shortages but farmers manage it on their own. They purchase dry fodder from outside/collect from own farms during winters and store it for the coming seasons. Each farmer does this on the basis of their capacity and storage space. The number of cattle kept by a farmer is in direct proportion to the fodder available to him/her. Farmers who have lesser provisions for fodder have lesser number of cattle and vice versa. Sometimes, farmers sell excess animals in times of adversity.

Dairy farmers did not even cite fodder as a shortage unless being asked about and then also they denied having acute shortages in the past decade. According to them, one good monsoon takes care of fodder from crop residue for next two years. And people usually keep those provisions if they are doing dairy husbandry in larger numbers. However the price of fodder has been going up in recent years. Due to low rains, the price of fodder has gone up from Rs. 3-4 per bundle of fodder [one bundle contains roughly 2-3 kg of fodder] last year to Rs. 8-10 per bundle this year. There is a realisation currently among the dairy management and milk producers that something needs to be done to address the fodder shortages which is slowly emerging as a critical input for the the sustenance of dairy farming at Banaskantha.

What has been the role of Science and Technology in this case? The dairy has adapted several technologies to support its growth. And this include: computerisation of quality testing and payments, chilling equipments, automated cleaning, development of new products, automation of milk plant, in house research on cow and buffalo breeds. Most of the innovations so far have been on the breeding, health, milk collection, value addition and relationship front. Further increase in milk production has to come from innovations in feeding and nutrition. But there hasn't been any interface with the Indian agricultural research establishment. The need for identifying the right fodder types and supporting farmers with knowledge on the best and cost effective nutrition for animals is becoming important. Science and Technology organisations could support the dairy in doing this better. However there hasn't been any major effort in this direction either from the dairy or from the research establishments.

Seva Mandir

Seva Mandir is a non-governmental organization (NGO) working for the development of the rural and tribal population in Udaipur and Rajsamand districts of southern Rajasthan. In Udaipur district 70% of the land in villages is public land [50 % forest land that vests with the forest department, 15% waste land that vests with the revenue department and the rest 5% is pastures]. Of this 70% land, several pockets have been encroached or privatized. Such encroachments opens up the area for further degradation and it create a complicated network of patronage at the village level thereby diluting the efficacy of village institutions. Widespread encroachment of the commons has been made possible by the absence of the required norms, management systems and institutions.

Seva Mandir realized that the generation of these lands is central to sustainable local development because of its positive ecological, economic and socio-political benefits. Its initial interventions had focused on encouraging plantation on private wastelands but as the work matured it shifted increasingly to the degraded commons – including both

pasture lands and forests. As collective entitlements is a must for creating a sense of tenure among the communities and also for participatory, sustainable land governance, it started to evolve a social capital base by forming village groups [*samuhas*] based on the notions of democracy and equity. The village institutions include representations from all sections of village community, and decisions are taken in the group meetings. The institutions were mainly aimed to organise the fragmented communities, and provide them a platform to raise their concerns and take responsibility of their own development. An elected body is formed in each village from the *samuha*, recognised as the Gram Vikas Committees (GVCs), and it acts as the executive body for developmental works.

Seva Mandir has invested a substantial time and resources for building these self sustaining village institutions. In regard to the interventions of common lands, the village institutions play a vital role at various levels starting from planning of work, taking land on lease from panchayat and upto supervision of physical works and managing the created assets at the later stage. One of the key functions of the VIs is to negotiate with the families who have encroached upon the common lands. The institutions negotiate with them, which is a complex process and many a times take considerable time, with facilitation from Seva Mandir. Once the encroachers vacate the common lands then the institutions decide for the compensation for them. Though the whole process is lengthy but it creates the consensus among the whole group and makes the common land work sustainable. When the physical work is done, community contribution in cash & kind, and participation of benefiting households in the form of labour has always been encouraged. This has helped in facilitating community ownership for the assets, and ensuring their better management in post-intervention period.

Over the last two decades, Seval Mandir has treated more than 13000 ha of degraded common and private pasture lands under its programme. Seva Mandir has protected and regenerated 162 pasturelands in Udaipur and many of these have been systematically and efficiently managed over the last 15-20 years. They have been raising grass and other products in a very planned and systematic manner. The grass is cut by the livestock keepers during days and based on the norms that are decided in the meeting of the village group.

In collaboration with the forest department, it has also protected and managed more than 1300 ha of land under the Joint Forest Management [JFM] programme.. As part of the Joint Forest Management programme, Seva Mandir started working with the Village Forest Protection Committees [VFPCs] to regenerate the degraded forest lands from 1991. It is currently working with the JFM activities in collaboration with the Forest Department in 19 sites.

Under JFM, local people protect forest lands and help in their regeneration and management in collaboration with the forest department. Though they have to work as equal partners, in reality it emerged more as a patron-client relationship, with forest department exerting control on all regulatory and decision making aspects with the local people acting as clients. There were other operational issues relating to awareness of operational guidelines like membership pattern, structure of executive committees,

meetings, role of panchayat members and forest officials in the committee, memorandum of understanding, election process, protection of developed JFM area and encroachment problems with the VFPMCs had to deal with. In many cases, there were conflicts among neighbouring villages over issues of curtailed access and disputed boundaries. While working on JFM, Seva Mandir realised that there was a need for sustained dialogues within and among VFPCs and also between VFPCs and the Forest Department. This led to the formation of Van Utthan Sansthan [VUS], a federation of VFPCs. Its main objectives include: liasing with the Forest Department to improve institutional interaction and improve the collective bargaining power of VFPCs, initiate conflict resolution among VFPCs by way of dialogue and negotiation, training and capacity building of VFPCS and policy advocacy. From the initial 22 VFPCs today VUS has become a network of 101 VFPCs. VUS was formally registered in 2003.

Though Seva Mandir has been successful in forming village institutions, removing encroachments and protecting and developing common lands thereby leading to improved availability of fodder grass, these initiatives face several challenges from some of the recent policy changes. There is a real danger that these could reduce the motivation of communities to manage common pasture lands/forest lands. These include:

a. Rajasthan's Panchayat Raj legislation [1996]- This legislation gives panchayats various powers to shape institutional arrangements for management of pasture lands. This legislation gives the panchayat greater power than was the case before, increasing the likelihood of panchayat domination and interference in silvi-pasture management. Panchayats tend to be revenue driven, while communities tend to be more interested in subsistence benefits from the pastureland. This could influence the way in which pastures are rehabilitated and managed and benefits are distributed.

b. The Forests Right Act [FRA] 2006 recognises and vests the forest rights and occupation in forest land in forest dwelling scheduled tribes and other traditional forest dwellers who have been residing in the forests for generations. As per the act, all encroachments till 13 December 2005 are to be regularized and given rights over land, which is under cultivation. The Panchayats/Gram Sabhas have been given rights to constitute and receive claims from the Forest Rights Committee [FRCs] inspect the areas and recommend cases for regularization. Though individual and collective claims can be submitted, there is a fear that providing individual claims would lead to illegal privatization of forest land. Considering the long tem implications of this, VUS is trying to pursue communities to submit claims under "collective rights".

Protection and regeneration of pasture and forest lands on which the poor depend for livestock keeping, essentially depends on the active involvement and co-operation of village communities. This would be possible only through developing community based organizations and developing their capacity to deal with institutional, policy and technical challenges. Institutional innovations on group mobilization, removal of encroachment through negotiations, protecting and regenerating common lands through community participation and forming collectives of user groups to deal with capacity development and policy change have all contributed to the upgradation of the natural resource

management system. This led to the emergence of new arrangements for the generation and use of fodder. Productivity of pasture and forest lands could be improved through application of knowledge [pasture management, selection of right grasses and trees, forest product utilization etc]. However, the role of science and technology is only very limited.

Conclusions

Fodder has assumed importance in both the cases due to systems upgrading. In the first case this has been due to the upgrading of an agro-industrial enterprise. The Indian co-operative dairy model emerged as a right institutional innovation for integrating the different kinds of knowledge needed for innovation to happen. In the second case, it has been the upgrading of a natural resource management system. The innovation has been more about interplay between policy and institutional development and the role played by organisations such as Seva Mandir which has the capacity to manage this process.

In both cases, the organisations have been using the existing stock of knowledge in upgrading the systems. But as systems upgrade, the existing stock of knowledge becomes insufficient and research driven knowledge become limiting. Agricultural S&T hasn't played any significant role in both the cases, but it could play a very important role if research could somehow identify opportunities for engaging with the process.

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Session 8: Reflections and Implications

Implications for Policy and Practice

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Public investment in network development has short and long term development impacts.

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. 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, organisational and institutional innovation. While the entry points and key players involved in networked activities have not necessarily been the poor, there is evidence that the poor have specifically benefited and this has often resulted from strategies employed by innovation broking organisations. The non-poor have also benefited and this has been important to ensure their participation which in turn is critical to the viability of network based innovation. Long term impacts have been created in the sense that idea of working in a networked way for innovation has been established as a routine as a result of the experiences gained by a diverse set of participants in the project. Investing in innovation capacity development is therefore a legitimate form of public support despite the fact that the non-poor will also benefit and indeed it is the non-poor that helps generate incomes and opportunities for the poor.

Innovation capacity development creates demand for research and innovation brokers can be a way of helping embedded research within innovation processes.

The fodder innovation project demonstrates that usually networks mobilise existing knowledge (technical and otherwise for innovation). However under some circumstance no knowledge or technology is available and new research is required to solve problems. Sometimes this involves research to refine existing technologies; for example, selection of improved fodder varieties. To make use of research as a specialised form of knowledge production strong operational link to networks seems to be important. Innovation brokering organisations are thus critical partners for agricultural research organisations wishing to embed themselves in innovation processes of developmental significance. This also suggests that public support of innovation broking organisations is a legitimate public policy tool and is complementary to public investments in agricultural research.

Innovation capacity development is a blunt instrument more suited to sector upgrading and not necessarily suited to addressing very specific issues such as fodder scarcity in isolation.

While the innovation capacity development approach has addressed fodder issues it has first been necessary to upgrade livestock production and marketing systems. This has variously involved upgrading dairy systems; upgrading natural resource governance systems for access; and upgrading input supply systems such as credit, animal health services and even fodder. Often it have involved an upgrading of a combination of these input and output systems, at which point it has become worth while addressing the fodder scarcity issue either though technical or institutional means. This may be thought of as demand-led innovation. Another feature of the approach is that not only has it used a diversity of entry points to build capacity and upgrade systems, but, because it has been following emerging opportunities as well addressing constraints it has led to outcomes that are not related to fodder or even livestock, but are never the less addressing the aspirations of poor rural people. If it is accepted that the capacity development approach is having developmentally useful results, the implication of this is that projects need to adopt a broader thematic focus that bundles together a number of specific sector development objects such as fodder scarcity, animal health, market system development, and milk quality. The caveat being that the success of the projects needs to also be judged in terms of wider outcomes, the specific nature of which can not necessarily be predicted in advance (see next point).

Rethinking evaluation, monitoring and learning.

Interventions looking at using an iterative, process-driven approach to strengthening systems – as in the fodder innovation project – present challenges for evaluation and emphasises a different roles for M&E. This is typical of an action research process. However it is challenging in certain donor environments as it suggests that such a process driven agenda will by necessity require that the specific objectives of the intervention will change over time and this has implications of the way accountability monitoring is conducted. One implication is that much closer dialogue with donors is required than is usually the case. More generally there are conceptual challenges to M& L that have become apparent in this project. For example, developing socio-economic base lines is difficult because impacts may arise in unpredictable way both in terms of type and geographic location. As a result monitoring indicators -- socio-economic, technical and institutional -- can not necessarily be predicted in advance and therefore tracking change has to be iterative and evolving rather than before and after. M&L becomes much more important to assist a process driven approach, but standardising such process and results formats was found to ineffective. Nurturing learning was thus much more ad hoc and relied on tried and tested ideas such as organising meeting for project staff to talk about ideas and plans.

Capacity development is legitimate way of learning about fodder and livestock innovation.

As a project experimenting with developmental process around innovation capacity development, FIP has been questioned as to whether it was research or development. While there were operational challenges involved in integrating the research and the

development components -- that in a conventional sense probably compromised both -- the project has been able to develop a robust understanding ways of enhancing fodder and livestock innovation. This understanding provides lesson which are relevant to the technical and social disciplines of the research and, perhaps more importantly provide insight into the policies and new ways of working required to make more effective use of livestock science and technology. One striking implication of this is that innovation research of the type conducted by this project should routinely be conducted as part and parcel of the new generation of agricultural research projects that are increasingly been asked to intervene in the development area and demonstrate immediate field level impact.

Implications for KPOs'

The experiences of the FIP project reveal that the most powerful role for KPOs' is not in directly implementing activities, through demonstration of technologies or distribution of resources – in fact such a role is merely a substitution for the role normally played by public agencies or the market. Instead their most powerful role is a catalytic one, mobilising the resources and actions of others and brokering the networks and relationship needed to make innovation happen. Quite often this role involves spanning the macro context of the policy domain and the micro context of actors and activities in rural areas. Critically part of this role involves acting as an advocate on behalf of the poor within these emerging innovation systems and these organisations and this type of role is therefore a key governance mechanism in emerging capacities to innovate. KPO's may need to slightly reoriente their activities and human resources to better fulfil this role.

Implications for ILRI and other IARCs

The FIP has detailed implications for programme design, many of which have been dealt with in the presentation on what should be done differently. There are also more generic implications. The first is the value of operating large, long term projects that address broadly defined sector development goals. This provides the scope and the time scale to reap the benefits of an innovation capacity development approach. The justification of such an approach is not the developmental outcomes, but the opportunities that such an approach offers to learning how to mobilise livestock research and other livestock relevant information and ideas for developmental out comes. Secondary benefits for ILRI would be the emergence of new researchable topics. So by partnering with organisations in networks and being catalytic in the development of these networks ILRI could be better embedded in local innovation processes. Its international public goods mandate however could still be full filled if resources were devoted to systematically learning from these experiences and inform international debates about way of enhancing livestock innovation and particularly about how to mobiles livestock related knowledge. Over time this suggests that the emphasis of ILRI should shift from being an international centre of excellence on livestock science and technology, to being an international centre of excellence on the science of using livestock science, technology and knowledge for innovation and development.

Implication for DFID and other investors in agricultural research and rural development.

Suggest the need to invest in new types of project that straddle research and development. These projects should be at least 5 years and should have an explicit agenda of systematically learning lessons on how to strengthen the capacity to innovate with a view to sharing these lessons with local stakeholders (public and private) as well as the national and international development community.

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