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Supporting Poor People to Access Farm Power

Experiences of the REFPI Project in Bangladesh

**Supporting Poor People
to Access Farm Power :**
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September 2003

Department for International Development (DFID)

This publication was prepared by Cate Turton¹ and Rita Afsar².

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1 Setting the scene : Poverty, livelihoods and power in rural Bangladesh

Rural life in Bangladesh is changing fast. Physical infrastructure is expanding and marketing and communication channels are improving. The number of small shops in villages has increased substantially, as has petty trading in villages and bazaars. We are seeing the rapid development of rural industry and explosive growth of the rural transport sector. Rural people are taking advantage of these changes to diversify their livelihoods. In some areas, remittances from migration are now the most important source of household income, but the greatest expansion of livelihood opportunities has been in the services sector.

Mechanical and (to a smaller extent) electrical power is playing a key part in this transformation. Over the last two decades, the use of farm machinery has increased dramatically. Irrigation is now all but fully mechanised; recent reports suggest that, by 2000, 60-70% of land was already being tilled by power tillers. Women used to spend hours processing rice using foot-operated dekhi, but today mechanical rice mills and hullers are taking over this chore. Small diesel engines now power river boats and motorised vans. A vibrant sector has developed to service the mechanisation process, from businessmen who import equipment to village-level craftsmen who repair it and manufacture tools and spare parts.

Some things are slower to change, however, Approximately half of the country's people still live below the poverty line and 80 per cent lives in rural areas. This amounts to 50 million people engaged in a daily, endless struggle to meet basic needs. They are isolated from the rural transformation process - unable to take advantage of new livelihood opportunities brought by the increased availability of rural power, new technologies and the mechanisation process.

The poor are often isolated from the opportunities and benefits generated by developments in farm power.

2 The development opportunity

Access to technology and sources of power is crucial to the poor. This is borne out by the fact that poverty levels are significantly lower in countries that have shown high adoption rates for new technologies. But, all too often, the poor do not have access to power or new technologies. The Research and Extension on Farm Power Issues project (REFPI) aims to address this inequality. It sets out to develop and test approaches for delivering appropriate rural power technologies and information to poor rural households. From the outset one thing was clear: REFPI was likely to succeed only if it could address poor people's priorities, create new and better livelihood opportunities and improve their quality of life.

Figure - 1



3

The REFPI approach



Figure - 2

From university-based research to RD&E partnerships

The REFPI project was conceived in the early 1990s to research the impacts of the rapid increase in the use of power tillers in Bangladesh. The project was based at the Department of Farm Power and Machinery of Bangladesh Agricultural University (BAU). It was continuously adapted - some might say pushed and pulled in different directions - during the mid and late 1990s in response to changes in donor and national policies but eventually began its work in 1999. The major component of REFPI is a competitive grant system (CGS) - acknowledgement of the need to capitalise on the experience of the full range of institutions with skills and knowledge of farm power issues.

Using SL principles to strengthen poverty impact

The Sustainable Livelihoods (SL) approach ideally makes development interventions people-centred and therefore poverty reducing. In order to become more pro-poor, development support initiatives must be fashioned from a good understanding of the factors that shape people's livelihoods. Core 'livelihood' messages were developed to help REFPI put the SL approach into practice (see Box 1).

Above all, SL approaches stress that project success be judged in terms of its impact on poor people's livelihoods rather than on how many new technologies it has developed or new partnerships it has established. To reflect this, REFPI changed its goal from one that focused on increasing the effectiveness of farm power in small farm systems in Bangladesh to one that placed poor people's livelihoods at the centre of its vision and strategy.

'Sustainable Livelihoods approaches promote a holistic understanding of poor people's livelihoods. They explore the vulnerability context in which people live, the assets they have access to, the strategies they adopt, the policies and institutions that shape their decisions and the outcomes to which they aspire'

Box 1 : Core livelihood messages

In order to become more effective in reducing poverty, projects need to:

- shift their focus from thinking about activities and outputs to thinking about the impact on poor people;
- be explicit about how project activities directly and indirectly affect people's livelihoods;
- be clear about whether people's own livelihood priorities are being addressed;
- ask what it can do to improve its 'fit' with the livelihoods of the poor;
- take into account the key policy and institutional linkages and ask how it can strengthen micro-macro links and contribute to the policy process;
- Has an implication for how the impact of the project is monitored and assessed.

The poverty and livelihoods agenda was an ambitious one for the REFPI project. Such a shift involved a deep-rooted change in the objective and client groups of the project but, more importantly, it entailed a fundamental shift in the way that universities and other research, development and extension (RD&E) actors went about their work (Table 1).

Table 1 : REFPI's shift in focus

REFPI's old agenda	REFPI's new agenda
Researchers drive research	Clients drive research
Researchers work in laboratories and on station	Research is conducted in the farmers' fields
Research is isolated from other players in the change process	Research is in partnership with GO, NGOs and private sector
The focus is on technical and engineering problems	The research remit takes in the wider environmental and socioeconomic perspectives
The focus is on applied research	The focus is on adaptive research
The work has a narrow sectoral focus	The focus is on sectoral research within the known livelihood context

Figure - 3

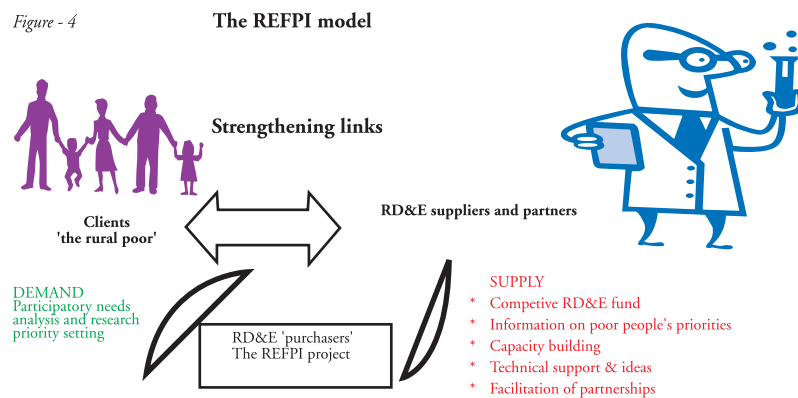


4 Farm power and livelihoods in practice

The essence of REFPI's approach has been to facilitate and strengthen the linkage between the suppliers of RD&E and their ultimate clients – the rural poor (Figure 4). REFPI has worked primarily on the supply side of the relationship (shown in red). The focus here is on:

- building the capacity of RD&E actors to carry out demand-driven research;
- improving the quality of RD&E by stimulating competition
- facilitating linkages between institutions that have mutual interests
- facilitating partnerships amongst suppliers, based on comparative advantage; and
- providing technical support and inputs to suppliers.

REFPI has worked less on the 'demand' side of the equation [shown in green]. It has limited its interventions to participatory assessments with poor people of their needs and priorities in relation to farm power, and to some specific studies on the livelihood aspects of farm power. To some extent, the project assumes that the demand side of the equation will indirectly be taken into account if the right systems and incentives are put in place for the RD&E suppliers (for instance monitoring success against suppliers' impact on livelihoods).



5 The livelihood result?

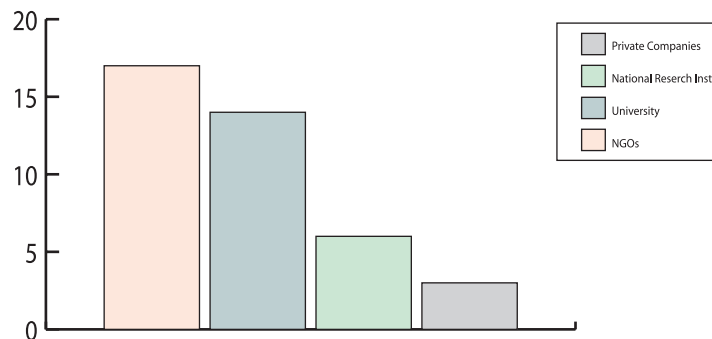
‘A way of working that is relevant to the livelihoods of the poor’

REFPI funded RD&E projects cover a wide range of issues, drawing in a variety of institutions relevant to a broad spectrum of clients, from tribal groups and women to small farmers, labourers and others (see Table 2 and Figure 5). NGOs figure widely as an intermediary.

Table 2 : Classification of RD&E projects by subject

Subject area	Number
Equipment (threshers, reaper, spreader, potato, drying, briquette)	13
Food processing technologies	9
Gender targeted equipment	8
Livelihoods, gender and health studies	7
Irrigation systems and equipment	4
Enterprise development	4
Extension packages and field work	3

Figure - 5 Classification of RD&E projects by lead institution



“Which delivers real livelihood impact...”

The achievements of REFPI go beyond establishing a ‘new way of working’. Evidence is emerging that this new way of working has tangible impacts on the livelihoods of the poor. Among the most impressive and unexpected are to do with increasing poor people’s access to farm power, and information on farm power. This alone has:

- Increased labour productivity and reduced labour shortages
- Reduced workloads and drudgery, especially for women
- Created livelihood opportunities, particularly for the landless, such as a hire service for farm implements
- Created a skilled labour pool amongst agricultural labourers
- Improved service availability for those who cannot afford to purchase their own machinery
- Created new livelihood opportunities in agro processing
- Generated employment opportunities
- Stimulated local entrepreneurship
- Empowered partners, entrepreneurs and women

Case study 1: Farm implements and livelihood impact on women in Lalmonirhat District

RDRS is a large national NGO which works with a local NGO in northwestern Bangladesh to develop and promote simple farm implements for women. Skill development and gender awareness training for men and women have been key parts of the programme. RDRS has tested a range of implements which have met with varying degrees of acceptance among women. For example, women did not take to the seed and fertiliser distributor whereas other technologies, such as wet and dry land weeders, proved more popular. The programme has created a demand for tools within the community, which local blacksmiths are now satisfying. Benefits of adoption include reduced drudgery and time saving for women, development of skilled and more productive labour. In themselves, the tools help to empower women. There is also demand within the community for more sophisticated and expensive machinery and implements - providing RDRS with new challenges.

6 Reaching poor people: emerging lessons

The REFPI project has accumulated four years of experience. Some key lessons have emerged about how to make project work relevant to poor people's livelihoods.

Lesson I

Adopt a practical interpretation of the SL approach

The message to all those involved in REFPI has been clear: poor people's livelihoods are the focus of the project. However, the project has avoided becoming entrenched in the baggage of livelihoods jargon and, for newcomers, a complex livelihoods framework. Instead, it took a practical approach by:

- developing a short-hand project title to remind people of its focus: Rural Livelihoods and Farm Power;
- adopting a demand-driven participatory approach to identifying poor people's needs and priorities;
- mainstreaming gender and environment issues;
- adopting a multidisciplinary approach;
- involving institutions that interface with the poor and affect their daily lives into partnership;
- focusing interventions locally, where change can make an immediate impact on livelihoods; and
- selecting RD&E proposals that had a realistic chance of delivering livelihood impacts within the project's timeframe.

REFPI adopted a broad definition of farm power: *'embracing all aspects of technology in rural development: covering the three power sources (human, animal and mechanical), the way the power is applied through tools, implements and machines and the effects on the wellbeing of humans and the environment*

Lesson II

Focus on development processes, not on target groups

REFPI cut through the difficulties of delineating target groups (such as, who really are the poorest?; which households are headed by women? etc.) and debating how they may be reached. Instead, it focused on processes of poverty alleviation. It set out to identify how RD&E on farm power issues can strengthen development processes, which in turn will bring positive livelihood benefits to the poor. These include employment generation, development of income-earning opportunities, improving access to services, improving productivity, skill development, capacity building of local institutions and improvements in working environments (tackling health and safety issues). At all stages, REFPI stressed the need to be explicit about how these processes both directly and indirectly impact on the livelihoods of the poor.

'The challenge is to identify how RD&E on farm power issues can strengthen development processes, which in turn will bring positive livelihood benefits to the poor'

It also avoided a narrow focus on the ultimate beneficiaries - the rural poor - recognising that a range of institutions have the potential to contribute to ensuring that RD&E on farm power has an impact on poor people's livelihoods. In some cases, targeting these intermediaries was the most likely route to livelihood and poverty impact (for example, targeting the private sector, local NGOs, service providers, marginal farmers and others).

Figure - 6



Lesson III

Competitive grant systems can deliver appropriate technology to the poor

The success of the REFPI CGS rests on the establishment of rules and procedures that encourage demand-led, participatory and livelihood-focused research. Many of these built on best practice in CGS such as:

- defining the RD&E agenda by identifying **poor people's needs** through a participatory process This is the opposite of the 'normal' way of doing things- where the ideas of the researcher- rather than the needs of the end user - drives the research;
- creating a **level playing field** on which all institutions are able to offer their expertise. This was achieved by training all suppliers in skills such as proposal writing, poverty assessment, participatory approaches and project-cycle management to help those that might otherwise be deterred from applying;
- **Awarding funds** on the basis of merit, which provides an incentive for improving the quality of research from organisations that are [sometimes] subject to minimal performance incentives or sanctions;
- **Funding transparency and accountability (Box 2)**
An independent Project Advisory Committee (PAC) was established to advise REFPI management on the selection of research proposals. This clearly separated the purchasers of RD&E (i.e. the REFPI project) from the providers (e.g. NGOs, BAU researchers) – thereby removing a potential source of bias. The high calibre of members was critical in establishing their credibility to perform this role. PAC members comprised respected professionals with varying expertise and from a range of institutions. It specifically included members who brought poverty and livelihood perspectives.

Best practice CGS:

A clear and credible governance structure

A clear research agenda with transparent criteria

Clear rules and resources invested in ensuring that suppliers understood them

Capacity building of RD&E suppliers at all stages of the project cycle

Output orientated monitoring and accountability

Box 2 : Ensuring transparency and accountability

- Transmit consistent and focused messages of objectives and aims
- Use a transparent and open bidding process through advertising in the national press
- Make sure bidders are clear about the steps and processes of project selection
- Use open criteria to assess merit of proposals
- Adopt a thorough screening process and give feedback on why the proposals of unsuccessful bidders were rejected
- Adopt systematic and uniform monitoring
- Adopt appropriate and stringent financial management
- Develop clear rules on ownership of assets from the outset

Figure - 7



Lesson IV

Successful partnerships go beyond role division

Partnership is a cornerstone of the REFPI project, which has promoted the message that, by itself, RD&E will rarely reach the end user. The partnerships promoted through REFPI have bridged many gaps - between technical and socioeconomic disciplines; between commercial and development agencies; between researchers and farmers. This has often challenged the boundaries and ‘comfort zones’ of members of the various institutions e.g. GO and NGO engagement with the private sector and BAU involvement with the informal sector – the myriad of small unregulated metal workshops and blacksmiths.

Partners are learning about each other's skills and strengths. A local NGO - CIRAD - commenting on the skills of a local mechanic, reported that 'top quality engineers are available at the local level'

Partnerships often go beyond the expected ‘role division’, for example, universities doing the research and NGOs doing the extension. Institutions are increasingly aware of the potential and value of partners’ knowledge, expertise and networks (Table 3).

Table 3 : Contributions of partners

BAU Researchers	NGO	Private Sector
<ul style="list-style-type: none"> • Ideas • Research methodology • Technical expertise • Linkage to other government research institutions • Linkage to other external sources of ideas 	<ul style="list-style-type: none"> • Knowledge of poverty and livelihoods • Credit to support new viable enterprises • Clients organised in groups • Local contacts and knowledge • Knowledge of appropriate technology [in some areas] 	<ul style="list-style-type: none"> • Ideas and indigenous knowledge • Innovations • Supplies credit to buyers • Applied technical expertise • Marketing systems • Knowledge of markets and farmer needs

Key features of the partnership approach include:

- Careful consideration of potential partnerships. It is interesting to compare the initially expected partners (Department of Agricultural Extension (DAE), large national and international NGOs and larger private sector operators) with the actual partners; smaller local NGOs and the informal private sector which were strongly involved. Recognising mutual benefits and hard negotiation should underpin the process of forming partnerships;
- The possibility of going beyond the basic supplier-contractor relationships and functional role divisions. Some of the partnerships jointly developed the RD&E agenda and negotiated among themselves how the work and budget were to be allocated;
- Strong emphasis on equal use of the relative strengths of each partner, building capacities across the board and encouraging lesson sharing through review workshops and direct contacts. Study visits and training sources usually included a mix of participants from different backgrounds and institutions- for instance, local NGO joined university staff on visits to India and China;
- Challenging the often artificial divide between research and extension. All RD&E projects had to integrate extension/uptake pathways into project design. Statements that DAE [or other agents] would take care of the extension were not accepted without convincing evidence.

Figure - 8



Case study 2 : Three-way partnerships: University, NGO and local entrepreneurs

CIRAD is an NGO local to Tangail district whose director is a former BAU student. CIRAD submitted a joint proposal to adapt and extend reaper technology to farmers. Ideas for reaper technology have grown from joint BAU-CIRAD visits abroad to trade fairs, BRRI and the experience gained from using a power-tiller-mounted reaper from China, purchased with funds from REFPI. A breakthrough came when CIRAD joined forces with Kalu Mia, a local metal worker and entrepreneur, who took the reaper apart and modified it to make it lighter and more manoeuvrable. He has continued to work with CIRAD in a synergistic partnership; BAU and CIRAD supply him with financial assistance, new ideas and machines, which he in turn dismantles and modifies to suit local conditions and purchasing power.



Figure - 9

Lesson V

Blend innovative ideas with local reality

The project management has been instrumental in bringing new ideas on farm power into the RD&E community and has cast its net widely in search of new innovations. This search has taken in the local level, where the project has tapped into the innovations of machine workshops and local blacksmiths, the national level, linking up with machinery importers and research institutes and the international level, with visits to trade fairs and other Asian countries. This has broadened awareness of what is possible amongst all involved in REFPI.

REFPI has not been afraid to push the boundaries beyond traditional machinery development. It has taken on innovative RD&E areas such as rural food processing, health and safety aspects of machinery and skills and entrepreneurship improvement.

'A notable feature of the REFPI project is the number of ideas and innovations that are 'bubbling around in the RD&E cooking pot'

Figure - 10



Case study 3 : Agro processing as an entry point for improving livelihoods

A factory processing locally available fruits such as pineapple and jack fruit was established in Madhupur by BAU and a local NGO, Mouchas Unnayan Sangstha (MUS). A MoU was signed between REFPI, the BAU researcher and MUS. The project provided capital for essential equipment, the researcher provided technical support on food processing skills and MUS was responsible for the supply of building and services and the overall management of the project. Twelve local women are now employed in the factory and products are sold as far away as Dhaka. This project has demonstrated what is possible and has grounded in reality the idea of local agro processing, which is much talked about in policy circles. The business seems to be sustainable and is not dependent on continuing government sponsorship, buys its raw materials locally, has generated employment for women, has good food safety standards, produces high quality goods and is connected to rural and urban markets.

Figure - 11



Lesson VI

Use the dynamism of the private sector to reach the poor

REFPI has shown how to work successfully with the private sector. It is learning that the private sector brings to the equation multiple benefits and functions; the sector is a source of ideas, manufacturers, innovators, adaptive researchers, employers and, lastly, it has a marketing network. Although private sector organisations lead only two of the research projects, they are active partners in a large number of projects.

In the absence of government extension capacity in engineering, the wide network of local blacksmiths, machine workshops and entrepreneurs provides the most likely [if not the only] means of scaling up the dissemination of farm power technologies and information. REFPI has seized this opportunity to build skills and capacity in this sector in areas of management, accounting and technical competence.

REFPI has demonstrated that the informal private sector is often the most relevant institution in terms of farm power for rural people-generating employment, providing services and as a source of technologies for farmers. Tapping into, and stimulating, the extensive network of blacksmiths and local entrepreneurs at a level that has an impact on livelihoods has been a key achievement of the project.

Most large villages will have either an agricultural input store or a small machinery workshop. The informal private sector is crucial to extending the benefits of farm power to the rural poor?

Figure - 12



Food stall in a village

Case study 4 : The dynamism of the private sector: Mahabub's transformation from metal fabricator to agricultural engineer

Mahabub, a man in his mid-forties was a metalworkshop owner in Jamalpur town who used to fabricate grills and steel almirah. He was fascinated when a relative-an engineer of BARI research station - demonstrated the use of a specially designed plough to the farmers. Mahabub came away with the idea of manufacturing agricultural implements. He also realised the importance of creating demand among farmers for farm implements and the need for capital to manufacture them. He saw REFPI's advertisement in the newspaper and prepared a concept note. REFPI suggested him to link up with the Intermediate Technology Development Group (ITDG), an international NGO. Initially, he had some problems working with ITDG, which wanted him to make spare parts. Mahabub, however, was keen to manufacture agricultural implements. Through negotiation and interaction, they settled on a compromise: Mahabub would receive training from BAU under REFPI to manufacture implements and he would also train the local blacksmiths / manufacturers to make parts. As part of this scheme he visited 8-10 districts to train local metalworkers. This collaboration helped Mahabub to expand markets for his products as he was able to establish links with BAU and NGOs such as Proshika. Mahabub eventually became an enlisted manufacturer of BARI and BRRI. ITDG in turn benefited from a group of trained local manufacturers who constitute the backbone of farm power development at the local level.



Figure - 13

7

How sustainable is REFPI's impact?

Access to farm power is crucial for the poor

The key lesson that emerges is that the development and extension of farm power technology is an important entry point for improving livelihoods of the poor. Indeed, we might extrapolate further that:

'If the poor are not given appropriate support to access farm power and technology, they are at risk of being further marginalised from development processes'

REFPI has demonstrated what is possible; with the right systems and incentives in place, technology research and development can make a difference to poor people's livelihoods. However it has achieved this on a small scale.

Improving poor people's access to farm power calls for changes in attitudes and working style

A central message is that achieving impact on poor people's livelihoods demands that research and development workers change certain attitudes and ways of working. REFPI has made considerable progress in this respect. This can be illustrated best by a recent exercise carried out by BAU to determine the strengths/weaknesses of REFPI (Table 4). It showed clearly that REFPI has succeeded in convincing BAU scientists of the value of poverty-focused participatory research, of working with NGO and private sector partners, and of the wisdom of moving towards a competitive approach to allocating research funding.

'Even the poor can use machines'

Improving access to farm power technology by the poor is critical. Without access to technology they will continue to be marginalised from the rural development and transformation process

Table 4 : Strengths and weaknesses of REFPI

Strengths	Weaknesses
<p>Systems generally appreciated</p> <ul style="list-style-type: none"> • Good communication • Output focused emphasis (meaning we think about what we are trying to achieve) <p>Linkages established:</p> <ul style="list-style-type: none"> • Between research and field • Between BAU, NGO and private sector • With other university departments • With credit providers-private enterprises now constructing reapers and other equipment • With local manufactures and farmers who have plugged an extension gap <p>University capacity strengthened</p> <ul style="list-style-type: none"> • Students can do fieldwork - quality of theses has improved immeasurably • Department got machinery which helped students • REFPI gave opportunity for research capacity building <p>Impact on end users</p> <ul style="list-style-type: none"> • Change in the 'field' • New industries can be developed based on demonstration • New machines have been developed 	<p>Some systems issues</p> <ul style="list-style-type: none"> • Banking problems • Budgets are too small • Remuneration is low - poor incentive structure • Monitoring and auditing is too detailed • Pay too low to attract NGOs to join <p>Questions over sustainability</p> <ul style="list-style-type: none"> • Shortage of time and funds prevents REFPI from meeting the demand it has created at field level • Having an impact on livelihoods takes time, but projects are short-lived • Seasonal fluctuations cannot be accommodated • Total time shortened through project formalities • Difficult to sustain the interest of farmers after withdrawal <p>Wider capacity issues need to be addressed</p> <ul style="list-style-type: none"> • Short training and visit opportunity only for farm machinery department. • Ideas for development of curriculum - but how to take it forward? • Extension service capacity and understanding of REFPI limited and no incentive to link up <p>Challenges the meaning of 'research'</p> <ul style="list-style-type: none"> • REFPI should not be called research

Furthermore, the majority of BAU scientists recognise the need to change if they are to survive and compete for research funding in the future and REFPI has provided a means to help them make that transition and understand its implications. This was neatly summarised by one of the BAU scientists: ‘REFPI has helped change our research paradigms shifting our focus from: strategic to applied and adaptive research; scientist to farmer; and laboratory to field’.

Will the changes survive beyond REFPI’s lifetime?

REFPI will shortly come to an end. The critical question is how sustainable are the changes that the project has had on ways of working. On a positive note it is clear that:

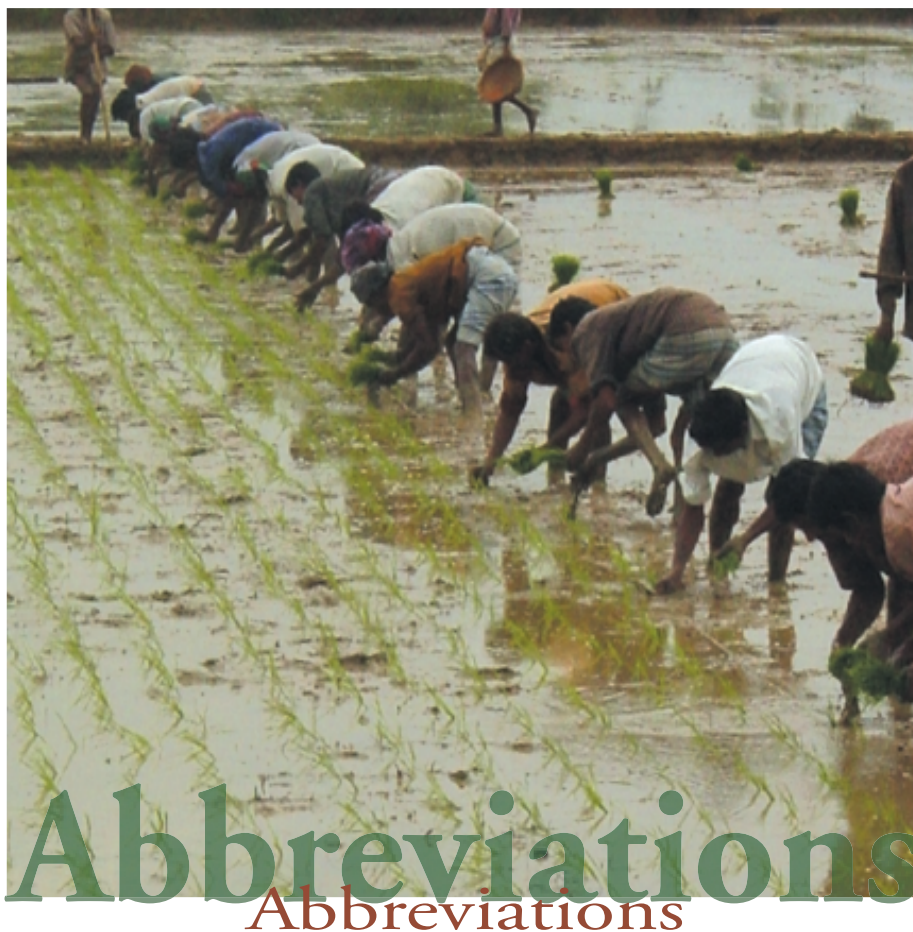
- Awareness and demands has been created at the local level;
- Networks/partnerships have been established between institutions based on mutual advantage;
- Capacity has been developed in research design and implementation across a broad range of stakeholders. For instance, skills in proposal writing and project-cycle management will be put to use in the future: ‘I can now write a proposal for a bank loan and have learned how to negotiate (MUS staff member);

The institutionalisation of demand led, poverty and livelihoods values and norms on a larger scale will, however, require more substantive change in the rules that shape the way in which research and development is conducted and which determine how Government supported RD&E institutions organise and behave. Without such change, many of these new ways of working will not persist beyond the lifetime of the project. Such fundamental organisational reforms require ministerial-level advocacy and action. This requires support at a different level to the one provided through a project such as REFPI, which works directly with the RD&E providers. On the other hand, technical and entrepreneurial skills have been further developed in the private and NGO sector and these are likely to be sustained and further developed after the REFPI project has ended in December 2003.

Figure - 14

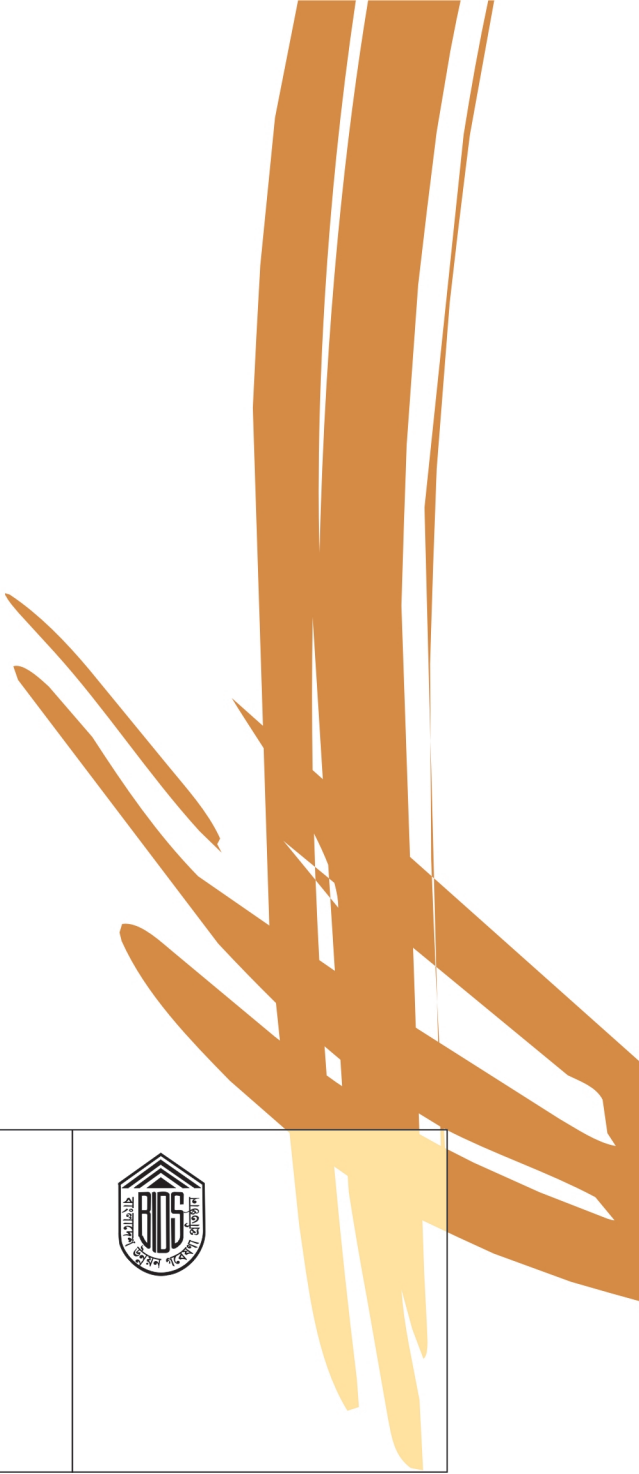
Hybrid rice seed production





BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BRRI	Bangladesh Rice Research Institute
CGS	Competitive Grant System
CIRAD	Centre for Integrated Rural & Agricultural Development
DAE	Department of Agricultural Extension
IDE	International Development Enterprises
GKF	Grameen Krishi Foundation
ITDG	Intermediate Technology Development Group
MUS	Mouhas Unnayan Sangstha
PAC	Project Advisory Committee
RD&E	Research Development and Extension
RDRS	Rangpur Dinajpur Rural Service
REFPI	Research and Extension in Farm Power Issues
SL	Sustainable Livelihoods
SUSS	Samannita Unnayan Seba Sangathan

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