Learning and experiences of the PETRRA project, BANGLADESH

PETRRA – an experiment in pro-poor agricultural research

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Strategies

DFID Department for International Development

IRRI International Rice Research Institute

Bangladesh Rice Research Institute

Poverty Elimination Through Rice Research Assistance (PETRRA), 1999-2004

a project funded by DFID, managed by IRRI in close collaboration with BRRI

Book 2. Strategies

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Project strategy

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Executive summary

The purpose of the Poverty Elimination Through Rice Research Assistance (PETRRA) project is to enhance rice productivity in order to contribute to poverty elimination. The project will achieve its purpose by facilitating the development of a demand-driven research system.

PETRRA's strategy has five pillars:

- resource-poor farm households as target audience;
- gender-sensitivity and environmental awareness;
- focal areas for project activities;
- farmer-participation in setting research priorities and technology development; and
- research themes linking technology and uptake.

PETRRA's focus is poor people, including women. Rice is the chosen entry point for addressing poverty. The target group that will benefit directly from PETRRA are the two sub-groups of the poor known as the moderate-poor and tomorrow's-poor. Extremely-poor households will benefit indirectly from lower rice prices and the opportunities created for non-farm employment by higher rice production and marketing. New rice technology is now acknowledged to have had a positive impact on poverty. By using rice as the entry point to target the moderate-poor and tomorrow's-poor, PETRRA focuses on the 'economics of graduation' and is therefore positioned within the mainstream of current thinking on poverty in Bangladesh.

PETRRA will concentrate on focal areas that represent the agro-ecological zones served by BRRI's nine regional stations. This will allow the sustainability of institutional partnerships. The focal areas are also representative of the general level of poverty within the country.

Stakeholder analyses identified 12 problem sub-groups. Highest priority was given to the lack of suitable technology, or farmers' lack of knowledge of new rice technology. Less emphasis was laid on economic constraints to technology adoption. The top four problems identified were water depth, seed quality, lack of knowledge, and lack of suitable modern varieties (MVs), especially for the tidal wetlands.

The sustainable livelihoods (SL) framework was used to structure PETRRA's logical framework into three generic research themes: productivity, uptake and impact. The research problems identified by the stakeholder analyses relate to both productivity and uptake, which will together determine impact. PETRRA will use these research problems as the basis for commissioning competitive research. Solutions suggested by the research proposals (RPs) will be jointly identified by researchers and farmers. Research activities will be organised as sub-projects (SPs) addressing specific research problems.

Implementing the strategy will begin with selected focal areas. The emphasis will be

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on action-learning to generate examples of rice technology, developed with farmer participation, that have sustainable uptake pathways and that reduce poverty among the target group. Within focal areas partners will share their experiences at regular meetings in an open learning environment. Experience and knowledge from research over several focal areas will be shared through reviews and workshops. PETRRA will strive to create an environment that facilitates learning and experimentation.

1. Introduction

- PETRRA is a research project whose purpose is to enhance the productive potential of rice-based farming systems in Bangladesh. The goal of the project is to substantially increase domestic rice production and incomes by 2008, such that it contributes towards a 50 % reduction in rural and urban poverty by 2015. The five-year, £9.5 million project is managed by the International Rice Research Institute (IRRI) in close partnership with the Bangladesh Rice Research Institute (BRRI).
- PETRRA starts with people, not technology. The success of the project will be measured not only in terms of technology development but by its direct impact on the livelihoods of resource-poor farm households. To achieve this goal, PETRRA will facilitate the development of a research system that is more responsive to the needs of resource-poor farmers. This will be done by financing the generation of technologies and extension materials appropriate for poor farmers on a competitive basis, through research partnerships between IRRI and the BRRI, universities, non-governmental organisations (NGOs), the private sector, and other local organisations.
- This document sets out a strategic framework for achieving PETRRA's purpose. The framework is consistent with the original project memorandum.

PETRRA's vision

- 'PETRRA is committed to creating an enabling environment for demand-led, participatory research that focuses on resource-poor farm households (across ecosystems) and that links best science practice with the identified priority needs for present and potential impact that is economically sustainable. The approach is environmentally responsible and gender sensitive'.
- PETRRA's vision statement implies a series of reversals in the research process. Bangladesh is already moving towards a more demand-driven research system. PETRRA's role is to strengthen and facilitate this process for research on rice.

Where we are now	Where we want to be
Technology	Uptake
Leadership	Partnership
Centralised	Decentralised
Non-participatory	Participatory
Farmers	Resource-poor farmers
Gender blind	Gender aware
Environmentally unaware	Environmentally aware

PETRRA's strategy

- To turn this vision into reality – to get the project from where it is now to where it wants to be – PETRRA needs a clear strategy. A strategy provides a framework for thinking about the future that helps consider alternative possibilities and their likely consequences on the project's goals, outputs and activities. However, strategy is also a learning process. There are aspects of strategy that cannot be decided in advance and must be built as the project evolves. The objective of this strategy document, therefore, is to

provide guidance on PETRRA's general direction but not to describe the precise steps that this will involve. Thus the strategy provides PETRRA with a compass rather than a road map with a pre-planned route.

- There are five main pillars to PETRRA's strategy:
  - A target group of resource-poor farm households;
  - Gender-sensitivity and environmental awareness;
  - Focal areas for project activities;
  - Farmer participation in prioritising research problems and technology development; and
  - Clearly defined research themes that link technology and uptake.

Stakeholder consultations

- PETRRA held Stakeholder meetings in five rice growing environments, the results of which have been summarised in 10 stakeholder reports. PETRRA's research strategy relies heavily on a synthesis of these reports, which provide information on target groups, the likely impact of new rice technology and villagers' research priorities.

Structure of the report

- Section 2 presents a poverty statement that summarises PETRRA's approach to poverty elimination, specifies its target group and identifies the likely impacts (direct and indirect) on poverty. Section 3 gives a brief overview of the relationship between poverty and rice in order to contextualise PETRRA and to locate the project in relation to current thinking on poverty in Bangladesh. Sections 4-9 each describe different aspects of PETRRA's strategy in more detail. Section 10 describes implementation.

2. Poverty statement

- *Alleviation of poverty through accelerated growth* is the first objective of the Government of Bangladesh's (GOB) fifth Five Year Plan (1997-2002). Poverty alleviation is seen to depend on rapid growth in agriculture. To achieve the necessary rate of growth in production, the plan recognises the need to evaluate agricultural research in terms of *rates of adoption of research output by end-users* (p. 243). This requires making rice research more relevant to the majority of rice producers, namely small and marginal farm households.

- PETRRA - as its name implies - is concerned primarily with poverty and not with rice. Rice research is seen as an instrument for eliminating poverty and new technology is judged not just by technical merits but on the potential it has for improving the income of the rural poor. PETRRA is not technology-led but poverty-led. To maximize the impact of rice research on poverty, PETRRA will facilitate the development of a research system that is more responsive to the needs of resource-poor farmers, that works with farmers in a participatory way, and that collaborates with other partner organisations to ensure that the impact of new research is felt as widely and speedily as possible.

- PETRRA will locate its research activities in focal areas that are representative of the levels of poverty found in Bangladesh. It will also work in fragile rice environments where research has so far been less successful in developing technology that can significantly raise rice production and incomes. This will further strengthen the decentralisation of rice research and make it more responsive to local problems and needs.

- PETRRA's direct impact on poverty will be limited to households that are moderately poor or that are vulnerable to poverty in the future. PETRRA's target group is broadly defined as households that are self-sufficient in growing rice between three to eight months per year. By targeting these two poverty sub-groups, PETRRA positions itself within the mainstream of current thinking on poverty that focuses on facilitating the transition out of poverty rather than on strengthening the resilience of the poor. Households that are extremely-poor (< 1800 kcal.) cannot be reached directly by the project since they lack sufficient land to benefit from increases in rice production and income. However, PETRRA is expected to benefit these households indirectly by maintaining rice production at levels that will lower rice prices for rural and urban consumers.
- PETRRA will directly target poor women in order to improve access to seeds and seed quality. Training in seed health will enhance women's knowledge and skills.

3. Poverty and rice: an overview

- PETRRA coincides with an important turning point in Bangladesh's history. Technology change in rice has accelerated to the point where, for the first time, the nation is self-sufficient in food. Bangladesh produced 38 metric tonnes of foodgrains, including 36 metric tonnes of unmilled rice within 12 months to June 2001. What seemed impossible only a decade ago has become a reality. The implications of this change are far-reaching. Agriculture is now starting to play its historical role in the process of economic growth, supplying food and releasing labour and capital for investment in the non-agricultural sectors of the economy. As the economy grows, the share of agriculture in national and household income will decline. This decline may suggest that there is less need for investment in rice research. Investment will still be necessary, however, to maintain the current rate of growth in foodgrain production, safeguard the environment, and make the process of growth as equitable as possible.
- Allied to this change in the resource base, we now have a much better understanding of the relationship between poverty and the new rice technology, and of poverty itself.

Rice technology

- Early studies of the new rice technology were generally pessimistic about its impact on poverty. This view is no longer tenable. Work in Bangladesh and elsewhere has shown that the direct impact of new rice technology has been positive, raising rice production and income for marginal and small farmers, as well as increasing the demand for hired labour, wage rates, and the supply of land for sharecroppers. Even regions that continue to be unsuitable for the new technology have benefited indirectly through income transfers via labour migration and lower rice prices for consumers.
- The continued spread of new rice technology, combined with a fall in the rate of population growth, has helped reduce the relative number of households living in poverty. While the incidence of poverty was relatively stable in the 1980s, it fell significantly in the early 1990s. Based on the cost of basic needs, the share of people living in poverty fell from 59% of the population to 53%, while the ones living in extreme poverty fell from 43% to 36%. A large part of this reduction in poverty reflects the steady decline in rice prices that has benefited landless

households and consumers in urban areas. These poverty estimates are five years old. Since then the acceleration in rice production and continuing fall in rice prices suggest even greater reductions in poverty.

Poverty

- Our understanding of poverty has also changed. Formerly, poverty was identified primarily as a lack of resources or power. Poverty programmes emphasised the provision of missing resources (credit, education) and empowerment. The paradigm was therefore one of poverty alleviation that strengthened the ability of poor people to cope with poverty. This approach was quite successful in reducing non-income poverty (education, clothing, housing). But it was much less successful in reducing income poverty, which remained relatively constant in the 1980s. Poverty alleviation was therefore concerned primarily with what has been called the 'economics of resilience' rather than with the 'economics of graduation' or the transition from poverty.

PETRRA and the new poverty paradigm

- Together, these shifts in perspective place PETRRA within the mainstream of the new poverty paradigm. This is because:
  - new rice technology is now recognised to play a positive role in eliminating poverty.

So long as rice remains a staple, improving rice productivity will remain a necessary (though not a sufficient) precondition for poverty alleviation. The dominance of rice in the agricultural sector gives it significant leverage in the *economics of graduation*. Transforming rice production sets in motion a series of changes in household food security, economic opportunities and income that will create sustainable livelihoods. While the number of households mired in poverty remains unacceptably high, the numbers moving out of poverty in the past decade suggests that poverty alleviation is possible once this breakthrough is achieved.

- PETRRA targets the poverty sub-groups whose entrepreneurial skills will drive *the economics of graduation*.

PETRRA can help pioneer new forms of agency that move from the traditional NGO-client mode of interaction towards one that is less asymmetrical and more businesslike, and that focuses on economic rather than social objectives. BRRI's work on *small farmer vulnerability* in the early 1990s (funded by DFID) anticipated several features of the new poverty paradigm. *Small farmer vulnerability* is the flip side of *the economics of graduation*. This research also identified a group of upwardly mobile small farmers who were acquiring land. Thus, PETRRA's poverty focus establishes continuity with this earlier research tradition.

4. PETRRA's TARGET GROUP

- PETRRA is committed to working with 'resource-poor' farm households, including women, to achieve its objectives. This categorisation needs to be defined more precisely to ensure that PETRRA works with an appropriate client group that shares its focus on rice production, can participate actively in technology development, and has the potential to achieve the income and production targets required by the project memorandum. The following definition of PETRRA's target group is based on information from the stakeholder analyses:

Households with three to eight months'

net household food security from own rice production and where more than half household income derives from own farm production.

This definition of household food security includes both the moderate-poor and tomorrow's-poor.

Target group justification

- The selection of these households can be justified on equity grounds because:
  - they represent the moderate-poor or tomorrow's-poor; and
  - they may lack access to new technology that can increase output and income from rice.
- The selection can also be justified on economic grounds because:
  - they have the necessary land and labour resources to intensify rice production; and
  - they have the entrepreneurial potential to achieve the increase in rice output and income required by the project.

Expected impacts on target group

- PETRRA's potential benefits for resource-poor households are illustrated in Table 1. The distribution of benefits has been related to the three poverty sub-groups identified by BIDS and now recommended by DFID,B for its Rural Livelihoods Projects (RLP). The relative importance of these benefits has been (tentatively) indicated.
- Benefits were identified by villagers Stakeholder meetings, and from recent literature. A new study of the flood prone rice environment, where irrigated rice has spread fastest, has identified important benefits such as an increase in the supply of land available for sharecropping; fixed-rent tenancy contracts for irrigated rice that benefit tenants; an increase in the share of household income from high-value crops as farmers diversify out of rice; and an increase in the share of income from non-farm sources as capital is released for investment outside agriculture (Hossain, Bose, and Chowdhury, 2001).

Impact on the extreme-poor

- PETRRA will not directly benefit households in the poverty sub-group known as the extreme-poor. But it is expected that these households will benefit indirectly in at least two ways.
- They will benefit primarily from lower

Table 1. PETRRA impact in relation to poverty sub-groups

Poverty sub-group	Daily calorie intake	Household food deficit	Anticipated PETRRA impact	
			Direct	Indirect
Extreme-poor (23 % of rural households)	<1,800 kcal.	Chronic	Nil	• Lower rice prices (++) • Higher employment (+) • Increased purchasing power (+)
Moderate-poor (29 % of rural households)	<2,112 kcal.	Occasional	• Higher rice production (++) • Greater household food security (++) • Improved knowledge of new rice technology, especially for women (++) • Lower unit cash costs (+) • Less harm to the environment through more efficient input use (+)	• Improved diet and health (++) • Cash released for investment in other farm enterprises and non-farm enterprises (++) • Increase in supply of land for sharecrop (+) • Higher school enrollment for boys and girls (+)
Tomorrow's-poor (21 % of rural households)	30-40 % above poverty line	Break-even		

Notes: ++ = Potentially high impact, + = Lower impact

rice prices that will increase their ability to buy rice and also to purchase other foods that will provide a more balanced diet. Rice prices have fallen steadily since the early 1990s. Consequently, real wages were 30% higher in 1996 than in 1983. Lower rice prices will also benefit the growing number of urban consumers, who are expected to form 40% of the population by 2020.

- The extreme-poor will also benefit from increased rural employment. This will come primarily from the non-farm sector (transport, construction, micro-enterprise). Demand for farm labour has risen more slowly, and real wages in agriculture have lagged behind those in other sectors. Growth in the non-farm sector is linked to technology change in rice production, however, which has released capital for households to invest more in non-farm enterprises, and created greater opportunities for crop marketing.

5. Gender

- PETRRA's gender strategy gives women equal importance with men in setting research priorities, participating in technology development, and evaluating impact on rice production and income (Paris, 2001).
- Rice research and extension programmes often paid insufficient attention to womens' productive role, which was perceived as an extension of household tasks and not part of agriculture. However, rural women play key productive roles in seed processing and post-harvest activities that contribute significantly to rice productivity and household food security.
- A gender perspective is also important for evaluating impact. Increases in income from rice may not be reflected in improved diet, health, and child schooling unless women have greater power over how that income is spent.
- PETRRA will not directly benefit the majority of female-headed households (5% of rural households) or households whose income depends on the earnings of women (20% of rural households), since they belong to the extreme-poor and are not part of the target group. It is important, however, that new rice technology does not have a negative impact on livelihood outcomes for these households.

6. Environment

- PETRRA's stakeholder reports show that rice farmers are keenly aware that new rice technology can adversely impact the environment and threaten sustainability. To ensure that its activities are environmentally friendly, PETRRA has developed an environment strategy (2001) that gives its research partners clear guidelines on how PETRRA's goals may be can be met while preserving the environment and contributing to sustainable development.
- The specific objectives of this environment strategy are:
  - Integration and compliance of project activities with environmental management standards;
  - Partner buy-in to sound environmental management for long-

term commitment to protecting the environment; and

- Human capacity development to promote sound environmental management in agriculture research and development.

- Actions to meet these objectives include the inclusion of environmental checklists in project monitoring and evaluation; public recognition of partners promoting sustainable agriculture; building awareness of the interactions between new technology and the environment; and developing capacity among research partners to ensure that environmental impacts of new technology may be properly monitored and evaluated.

7. Focal areas

- PETRRA's strategy will focus its activities in particular regions with distinct rice environments. Since PETRRA's chosen entry point is rice, it makes sense to select focal areas that represent different rice ecosystems. The approach is similar to the concept of *key sites* used in farming systems research (FSR). The approach is also consistent with that adopted by DFID's renewable natural resources research strategy (RNRRS), where research is focused on areas representative of six production systems in order to demonstrate measurable impact.

- PETRRA's choice of particular focal areas is consistent with its commitment to impact on poverty. Poverty measures for these areas (income, human development, and household food security) show that the focal areas are broadly representative of the levels of poverty that prevail in Bangladesh.

- In choosing focal areas PETRRA has decided to work in nine locations where BRRI has regional sub-stations. This has several advantages, namely:

  - *Sustainability:* PETRRA will not last forever. The future of demand-driven research depends on the strength of the relationships that are forged between different stakeholders at the local level. A key relationship is that between BRRI's regional stations and local, grassroots organisations working with the poor. Promoting these relationships is the best way of institutionalising farmer participatory research in BRRI and retaining the focus on poverty impact.
  - *Decentralising research*: Sixty percent of the budget for BRRI's regional stations goes to rice research on local problems. PETRRA's research activities will strengthen BRRI's capacity to address location-specific problems and provide incentives for BRRI headquarters scientists to work regionally rather than at the center.
  - *Research partnership*: PETRRA's research activities will be managed locally, not from the center. There will be links with BRRI's regional stations but the principal institutional actors will be identified through the competitive call for research.

8. Research priorities

- PETRRA's research priorities were obtained from Stakeholder meetings held at village, upazila, and district level between 1999-2000. Stakeholders ranked research priorities in order of importance. To simplify the presentation, priorities have been ranked on a scale of 1-10, with 1 signifying the highest priority.

- Most research problems were common across the five rice environments. Common problems were seed quality, high input costs, knowledge of MV cultivation and irrigation. Water depth

Table 2. Research priorities identified by stakeholder analyses

Problem	Combined rank (1=highest)
Water depth	2
Seed quality	2
Knowledge of MV cultivation	3
Lack of suitable MV	3
High input costs	4
Irrigation	4
Natural hazards	4
Farm power and labour	4.5
Soils	5
Pests	5
Quality of inputs	5
Low harvest prices	5
Other problems	6

was primarily a problem of the coastal region, while irrigation was ranked highest as a problem in the drought-prone environment.

- The ranking of problems from the stakeholder analyses suggests that the constraints to the adoption of MV rice technology are not primarily economic, but reflect the limitations of the technology and of farmer knowledge. Village meetings gave less importance to the cost of inputs and low producer prices than to water management, seed quality, the absence of irrigation facilities, and their lack of technical knowledge about new rice technology. This implies that there is scope to improve rice output and incomes through well-designed research programmes that focus on key technical problems.

9. Emerging research themes

- Research priorities identified by stakeholders were grouped into research themes using two conceptual frameworks.

Sustainable livelihoods

- The (SL) framework was used to develop three generic research themes. Each theme relates to a particular aspect of this framework. The SL framework can also be related to the project's purpose and outputs as specified by its logical framework. One advantage of the SL framework is that it emphasises the importance of uptake and impact as well as technology development. The SL framework is given for reference in Appendix 1.

  – Theme 1 (Productivity) focuses on the vulnerability context, or the external environment in which people exist. PETRRA can improve the vulnerability context by helping rice research to change trends, shocks, and seasonality in rice production.

  – Theme 2 (Uptake) focuses on the transforming structures and processes that shape livelihoods. These include institutions, organisations, policies, and legislation. PETRRA can improve uptake by helping rice research to become more demand-driven, creating more effective uptake pathways, and identifying policy constraints.

  – Theme 3 (Impact) focuses on livelihood outcomes. This includes increases in income, food security, well-being, and more sustainable use of the natural resource base. PETRRA will contribute directly to several of these objectives.

- The strategy matrix (Table 3) shows

how these research themes relate to the SL framework and to PETRRA's own logical framework. Most research problems cannot be related exclusively to one theme, however, since they include both productivity and uptake dimensions.

The rice technology continuum

- An alternative framework for viewing research priorities is provided by the rice technology continuum (Table 4), which divides technology change in rice since the 1960s into three stages:

The green revolution

Characterised by the spread of MVs across rice environments and associated increases in irrigation and fertilizer use. Increases in output come from the increase in area planted to MV rice.

Closing the yield gap

Characterised by improvements in the efficiency with which inputs are used. These include improved methods of fertilizer application, water management, and the introduction of IPM. Increases in output come from closing the technology gap, or improving farmer knowledge and skills to bring average actual farm-level yield closer to the maximum farm-level yield.

Shifting the productivity frontier

Characterised by the development of a new breed of MVs that offer scope for higher yields (e.g., hybrid rice). In the language of economics, this represents a shift in the productivity frontier since yields with these MVs are significantly higher without a change in the level of other inputs.

Theme I: Productivity

- In terms of the rice technology continuum (Table 4), three research

Table 3. Research priorities and the sustainable livelihoods (SL) framework

Sustainable livelihoods (SL) framework	Vulnerability context	Transforming structures and processes	Livelihood outcomes
Short description	Physical and economic environment	Institutions and policies	Income, vulnerability, well-being
PETRRA logical framework	Improved rice production technologies appropriate to resource-poor farm households identified or developed (output 1)	Capacity of rice research system to undertake demand-led research sustainably enhanced (output 2) Key policy constraints to enhanced rice-dependent livelihoods production identified and recommendations discussed in key policy fora (output 3) Improved methods for effective uptake of technologies for rice systems identified, tested, and recommendations for improvements in uptake pathways made (output 4)	Rice production and rural incomes substantially increased by 2008 (Purpose)
Research themes	Productivity	Uptake	Impact
Research issues identified by stakeholder analyses, with rankings	Water management (2) Lack of suitable MV (3) Farm power and labour (4.5) Soils (5) Pests (5)	Seed quality (2) Knowledge of MVs (3) High input costs (4) Irrigation (4) Fertiliser quality (5) Low harvest prices (5)	
Solutions	Jointly identified by farmers and researchers		
Sub-projects		Policy studies Uptake pathways	Baseline Studies, Knowledge, attitudes, skills impact study

Table 4. Research priorities and the rice technology continuum stakeholder analyses

Strategic issues	Rice technology continuum		
Stage	Green revolution	The yield gap	New production frontier
Technology focus	Seed-based	Knowledge-based	Seed-based
Rice environments	Tidal wetlands Flood prone Drought-prone	Irrigated Rainfed lowland favourable	Irrigated
Research issues identified by stakeholder analyses, with ranking	Water management (2) Lack of suitable MV (3) Irrigation (4)	Seed quality (2) Knowledge of MVs (3) High input costs (4) Pests (5) Soils (5) Fertiliser quality (5) Low harvest prices (5)	
Solutions	Identified jointly by farmers and researchers		Identified by researchers
Sub-projects			

problems relate to the stage of 'Green revolution' (water depth, lack of suitable MV, and lack of irrigation), while the remainder relate chiefly to *closing the yield gap*.

- These problems are broadly consistent with the research priorities identified by BRRI's master plan, and the assessment of research opportunities prepared by BRRI/IRRI for the project memorandum (Technical Annex 1). The problems identified by researchers included:
  - Low adoption of MVs;
  - Poor seed health;
  - Inefficient nutrient management;
  - Poor water management; and
  - Lack of salt-tolerant MVs.
- Although the problems identified by the stakeholder analyses appear technical, they offer scope for collaboration with the social sciences. One example is with water management for irrigation. The fragmentation of farmland means that a single command area will contain plots owned by a large number of households. This imposes high transaction costs on water buyers and sellers. To reduce these costs, irrigation is scheduled at fixed times and in fixed quantities. This may reduce the efficiency of irrigation and limit scope for closing the yield gap. Another example is the scope for rehabilitation of dead canals through community action.

Theme II: Uptake

- To facilitate technology uptake PETRRA will identify uptake pathways that link the design, development, and spread of technology with its farmer target group. This will require a process of farmer participatory research and creating partnerships with local organisations that will allow technology to spread rapidly inside the focal areas and beyond.

Uptake pathways

- PETRRA is committed to creating an open learning environment that brings together scientists, development organisations, extension agents and private sector organisations to participate with resource-poor farm households in addressing their research and uptake needs. Issues in governance within organisations and between organisations will also be on the learning agenda.
- PETRRA will pilot the development of effective uptake pathways by working at three levels:

- Linking farmers, researchers, and uptake organisations at village level:

  The first step is to review technology at the village level with our farmer clients. This will be done simultaneously with farm level rice production training. Partners involved in this activity, with funding from PETRRA, will be awarded pilot schemes on the basis of competitive submissions to TEC. The same process of joint planning with clients will hold.

- Linking into networks at the upazila level:

  The second step is linking up organisations at the local level. These organisations include GOB, NGO and private sector organisations and funding sources. Familiarisation with the Department of Agricultural Extension (DAE) strategy and DAE partnership programmes and NGO programmes is important at this stage. training of trainers (TOT) and essential development of training approaches and material will be important at all levels of scaling up.

- Linking into wider networks:

  The third step involves a more extensive linking with scientists, development organisations, extension agents and private sector organisations to address the research needs of a focal group of farmers. At this stage PETRRA expects other organisations to take the initiative in committing resources to facilitate uptake.

Policy studies

- Output 3 of PETRRA's logical framework is to identify the key policy issues that affect rice-dependent livelihoods and bring these to the attention of policy makers. Relevant policy issues should be identified from PETRRA's research agenda, which in turn derives from meetings with village stakeholders and expert consultations.
- PETRRA's policy studies framework (2001) recommended that the project support policy research by:
  - Commissioning new research through competitive calls; and
  - Facilitating dialogue through workshops and national fora.

The framework recommended that PETRRA commission nine sub-projects on specific policy issues. In addition, it recommended that PETRRA facilitate two national policy dialogues, the first on changing directions in agriculture policy following the achievement of self-sufficiency in foodgrains, and the second on institutionalising demand-driven research in the National Agriculture Research System (NARS).

- The results and recommendations from the policy studies will be presented to policy makers through various media, including national policy fora such as the Centre for Policy Dialogue (CPD), project workshops, reports, and policy briefs.

Theme III: Impact

- PETRRA's logical framework gives objectively verifiable indicators for the project's first four outputs. Several of these indicators require baseline studies to establish benchmark values in the focal areas. These include values for rice production (e.g., average yields, household food security), poverty indicators (both income and non-income indicators), the number of households using specific rice technologies, and information on farmers' knowledge, attitudes and skills (particularly women). It is important that benchmark studies are disaggregated by gender. An impact study will be conducted at the end of the project to identify changes in these indicators.

- The experience of working closely with selected households in focal areas over a five-year period offers scope to improve our understanding of the links between new rice technology and poverty. This opportunity should not be missed. PETRRA should consider drawing up a research agenda for studying impact during the lifetime of the project. Innovative approaches are needed. One example might be a case-study approach that tracks households over time. This approach is ideally suited for exploring qualitative aspects of the impact of rice technology on poverty, (e.g., gender roles, women's empowerment, social networks, and people's perceptions of changes in status). This would complement the quantitative data collected from large sample surveys conducted by BIDS on the analysis of poverty trends.

10. Implementing the strategy

- PETRRA's PMU will issue a new call for concept notes (CNs) based on the research problems identified by the stakeholder analyses. Guidelines for writing CNs and research proposals (RPs) have been prepared to make the research commissioning process as transparent as possible. These guidelines are available with the project management unit (PMU).
- The CNs will be reviewed by the TEC who will then approve the CNs that meet the criteria set by the PMU. Researchers whose CNs have been approved by the TEC will then be invited to prepare RPs.
- The stakeholder consultations were only the first step in developing a demand-driven research programme. They provide researchers with a broad characterisation of the farming system, social groups, and farmers' research priorities. The next step is to create a mechanism that allows the research strategy to respond to these needs in a dynamic way. PETRRA will facilitate this process by providing expert facilitators and training researchers in farmer participatory research (FPR).
- RPs will be prepared in consultation with local stakeholders. This will require visits to the focal areas to explore research priorities in greater depth and design an appropriate research programme with farmers. Researchers and farmers will develop an informal 'contract' that sets out their different roles and responsibilities for field-testing specific interventions. This 'contract' will specify how farmers are to be involved in implementing, monitoring, and evaluating the research programme.
- Research activities in a given focal area may be in different villages or unions or upazilas or districts within the region. Regular meetings will be necessary between research programmes to share knowledge and synthesise experiences within a given region. Organisations within the focal area that are operating independently will also be invited to participate. This will create a learning environment that will be important in identifying new and more effective uptake pathways.
- Some research themes such as integrated crop nutrient management (ICNM) may be conducted in several focal areas. Results and learning will be drawn together through planning and

review workshops. In additional an individual scientist may have a role as national team leader for a given theme. Such reviews will also bring in research ideas that are related to the research theme but not funded by PETRRA.

- Initially, PETRRA will concentrate on a few focal areas (say 4) to help project activities achieve a critical mass. Later it will graduate to working in more areas. The choice of which focal areas to start with reflect the priorities outlined above (sustainability, decentralising research, and research management), the need to work in districts that represent the national poverty levels and where the impact of rice research on poverty can be clearly demonstrated.

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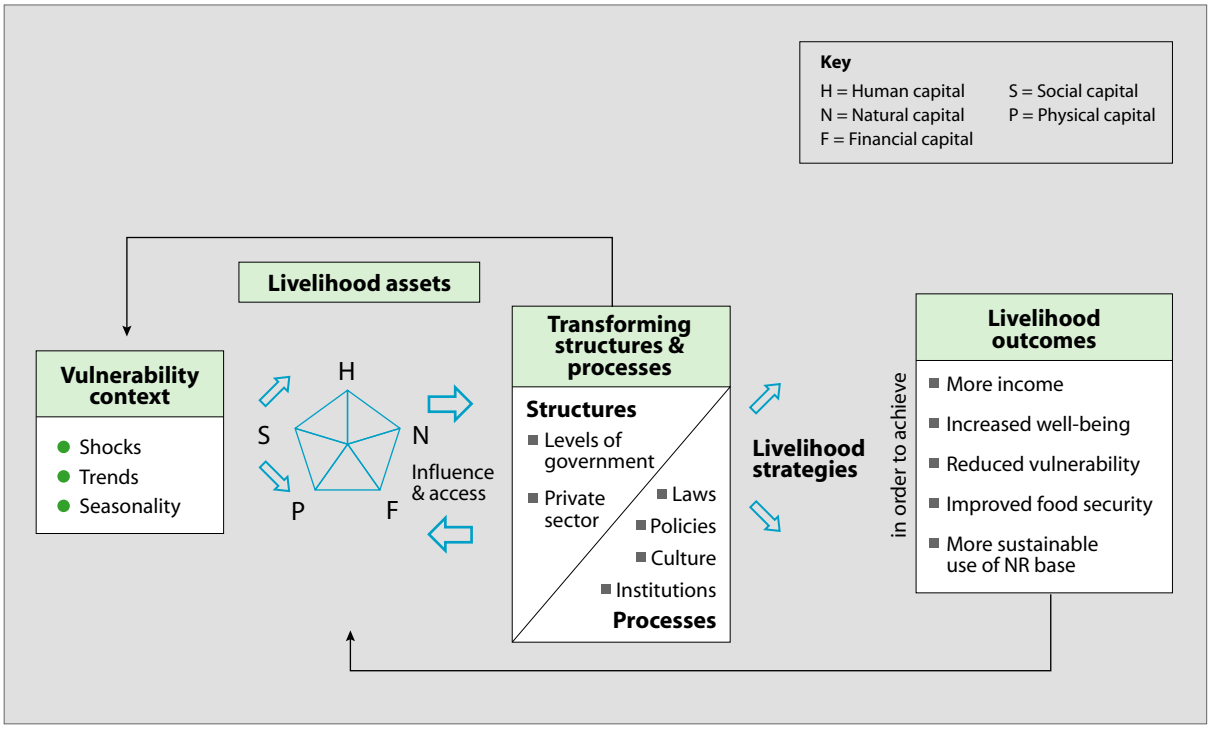
APPENDIX 1: SUSTAINABLE LIVELIHOODS (SL) FRAMEWORK

DFID's sustainable livelihoods (SL) framework



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Policy studies framework – the transition to market-oriented agriculture: achieving a poverty focus

Alastair W. Orr and Noel P. Magor

Executive summary

One of Poverty Elimination Through Rice Research Assistance (PETRRA) project's five outputs is to identify key policy constraints to rice-dependent livelihoods and to present its recommendations before key policy fora.

This report identifies policy issues that are relevant for PETRRA's research agenda. These were identified from PETRRA's stakeholder reports, secondary literature, and discussions with representatives of key institutions concerned with agriculture policy. The report also suggests the process (field research, desk reviews, or workshops) by which PETRRA's policy studies might address these issues.

The report argues that the achievement of foodgrain self-sufficiency in the late 1990s, together with structural changes in the wider economy present farmers with new opportunities to increase income through specialisation in crop and non-crop enterprises for urban and export markets. The transition to market-oriented agriculture can help eliminate poverty. However, this will require focusing agricultural policy more closely on poverty impacts. PETRRA's policy studies can be instrumental in helping to give the transition to market-oriented agriculture a stronger poverty focus.

The report recommends that PETRRA facilitate two national policy dialogues, the first on changing directions in agriculture policy following the achievement of self-sufficiency in foodgrains, and the second on institutionalising demand-driven research in the National Agricultural Research System (NARS).

PETRRA has already commissioned three sub-projects (SPs) on specific policy-related issues. These are: access to good quality inputs; livelihood diversification at the household level; and arsenic in the food chain. This report recommends that PETRRA continue to support this research, and commission an additional six SPs on specific policy issues. These issues are:

- seed sector performance;
- agriculture and the World Trade Organisation (WTO);
- developing workable institutional models for demand-driven research at the local level;
- non-governmental organsation (NGO)-business-public sector partnerships in service delivery;
- new rice technology and poverty; and
- surface water irrigation irrigated rice.

On timing, the report recommends that the dialogue on agriculture policy and other policy studies should be commissioned as soon as possible. However, it recommends that the national dialogue on demand-driven research be held later when PETRRA has gained more experience at the local level.

1. Introduction

PETRRA is a research project whose purpose is to enhance the productive potential of rice-based farming systems in

DFID Department for International Development

IRRI International Rice Research Institute

Bangladesh Rice Research Institute

Bangladesh. The goal of the project is to substantially increase domestic rice production and incomes by 2008 such that it contributes towards a 50% reduction in rural and urban poverty by 2015. The five-year, £9.5 million project, is managed by the International Rice Research Institute (IRRI) in close collaboration with the Bangladesh Rice Research Institute (BRRI).

Output 3 of PETRRA's logical framework is concerned with agricultural policy. The revised logframe (September 29, 2000) describes this output as follows:

'Key policy constraints to enhanced rice-dependent livelihoods production identified and recommendations presented and discussed in key policy fora.'

PETRRA can move the agricultural policy agenda forward in three ways:

- Supporting ongoing research on relevant policy issues;
- Commissioning new research through competitive calls; and
- Facilitating dialogue through workshops and national fora.

The choice of which approach to use will vary according to the policy issue in question.

This report builds on the policy dialogue *Bangladesh agriculture at the crossroads: current challenges* that was held in July 2000 with support from PETRRA. This wide-ranging dialogue explored recent structural changes in the agricultural sector and identified a number of specific issues that required attention from policy researchers and policy-makers.

Objectives

The general objective of this report is to provide PETRRA with a framework for thinking about agricultural policy that is consistent with the super-goal of substantially eliminating poverty, and with a sustainable livelihoods (SL) approach. The specific objectives are to:

- Identify specific policy issues, based on stakeholder reports, secondary literature and discussions with key individuals;
- Identify the type of policy studies needed (field studies, desk reviews, workshops); and
- Prepare the call for concept notes (CNs) for the first round of policy studies.

The report does not review the large literature on policy issues, though it refers to some key texts.

Structure of the report

Section 2 shows why policy is important for PETRRA. Section 3 provides a broad framework for integrating various policy issues that PETRRA might address. Section 4 argues the need to relate agriculture policy more closely with the broader policy objective of eliminating poverty. Policy issues are identified in section 5. Gender issues are highlighted in section 6. Finally, section 7 outlines priorities and sequencing.

2. RATIONALE

Why policy?

PETRRA's purpose is to enhance the productivity of rice-based farming systems, especially for resource-poor farmers. The systems approach adopted by PETRRA uses the sustainable livelihoods (SL) framework, which explicitly links the farm household with the institutions (structures) and policies (processes) at the macro-level.

By contrast, farming systems research and extension (FSR&E) defined its unit of analysis as 'the farm household' or (even more narrowly) as 'the farmer's field'. It saw institutions and policies as outside its

mandate. However, this limited the range of technology options that were available, since policies often determined what was and what was not profitable. And it limited the scope for technology adoption by resource-poor farmers, since uptake often depended on institutional issues of access and power. Consequently, the impact of FSR&E has been limited. A beautiful bird without wings cannot fly.

For example, BRRI invested heavily in research for deepwater rice (DWR), a marginal rice crop grown by resource-poor farmers. However, it never succeeded in releasing an improved DWR variety. What transformed the DWR environment was a change in trade policy, namely the abolition in 1988 of import duties on shallow tubewells (STWs). This halved the price of STWs and triggered a switch from DWR to irrigated rice, producing an all-round increase in income.

Why PETRRA?

PETRRA's goal is to help eliminate poverty by raising rice production and rural incomes. Similarly, the National Agriculture Policy (NAP, 1999) explicitly links agricultural development with poverty reduction:

In Bangladesh, it is possible to reduce rural poverty and raise the living standard of common people by establishing agriculture as a profitable sector (GOB, 1999, p. 3).

This correspondence in goals suggests that PETRRA's role should be to link agricultural policy more closely with poverty reduction. This means that its policy studies should have a clear poverty focus.

3. THE TRANSITION TO MARKET-ORIENTED AGRICULTURE

Changes in economic structure

PETRRA coincides with an important turning point in Bangladesh's history. Sustained economic growth is now transforming the structure of the economy. If this growth is sustained, then by 2020 Bangladesh will have an economy similar to those of middle-income countries today. Important features of this transition include:

- The 'urban future':

In 1996, one-fifth of the population was urban. By 2020 it will increase to almost one-half. Feeding cities with nearly 80 million people will provide agriculture with a huge market. By 2020, one-third of the demand for rice and one-half of the demand for meat and fish will come from urban areas.

- New patterns of food consumption:

As income rises, diets become more varied and rich in proteins. Demand will rise for livestock products, fish and edible oil, potatoes, vegetables and pulses. This provides a growing market for non-crop agriculture. A 10% increase in income will increase demand for meat and milk by 15% and for fish by 8%.

- Declining demand for rice:

Because of population growth, demand for rice will grow in absolute terms. This demand (allowing 10% for seed, feed, and wastage) is projected to reach 46 million metric tonne by 2010. Rice production must double in order to meet this demand. Eventually, however, demand for rice will level off because of slower population growth and rising incomes. After 2010 the growth rate required to meet consumption will be only 0.5% per year.

Market-oriented agriculture

In response to these structural changes, agriculture is becoming more market-oriented. Agriculture in Bangladesh has always had a strong market orientation, but the process of commercialisation is now accelerating. The transition to

market-oriented agriculture takes several forms:

- Specialisation:

At the household level, agriculture is becoming more specialised, with a greater share of farm income coming from commodities that are traded. The share of farm income from rice is falling as farmers specialise in products with higher profit-margins, namely, crops, horticulture, poultry, livestock, or fish. At the sector level, therefore, agriculture will become more diversified.

- Moving away from rice:

At the household level, farmers will re-allocate resources away from rice. Land that is marginal for rice cultivation (e.g., land planted to upland rice) will be released for other uses. As rice prices continue to fall, cutting margins, farmers will try to reduce unit costs by adopting modern varieties (MVs) and improving the efficiency of crop management. This should ensure that rice production increases in absolute terms.

- Growth in peri-urban agriculture:

Already one-quarter of all 'urban' employment actually involves jobs in agriculture, forestry, and fishery located in the peri-urban fringe. In fact, such activities are the major sources of urban employment.

Confirmation from stakeholder meetings

The transition towards a more market-oriented agriculture is amply supported by evidence from PETRRA's stakeholder meetings. In some cases, commercialisation has involved intensifying rice production by moving from rainfed to irrigated rice. In others it has involved diversification away from rice towards higher-value crops, as these excerpts show:

A decade ago importance of rice was far more compared to other crops… At present rice remains as the most important but crops like vegetables, pulses, potato, chilli are all also very important and not far from rice. Crops like vegetables, chilli had marginal importance a decade ago… (Stakeholder analysis report, south-central coastal region, p. 18).

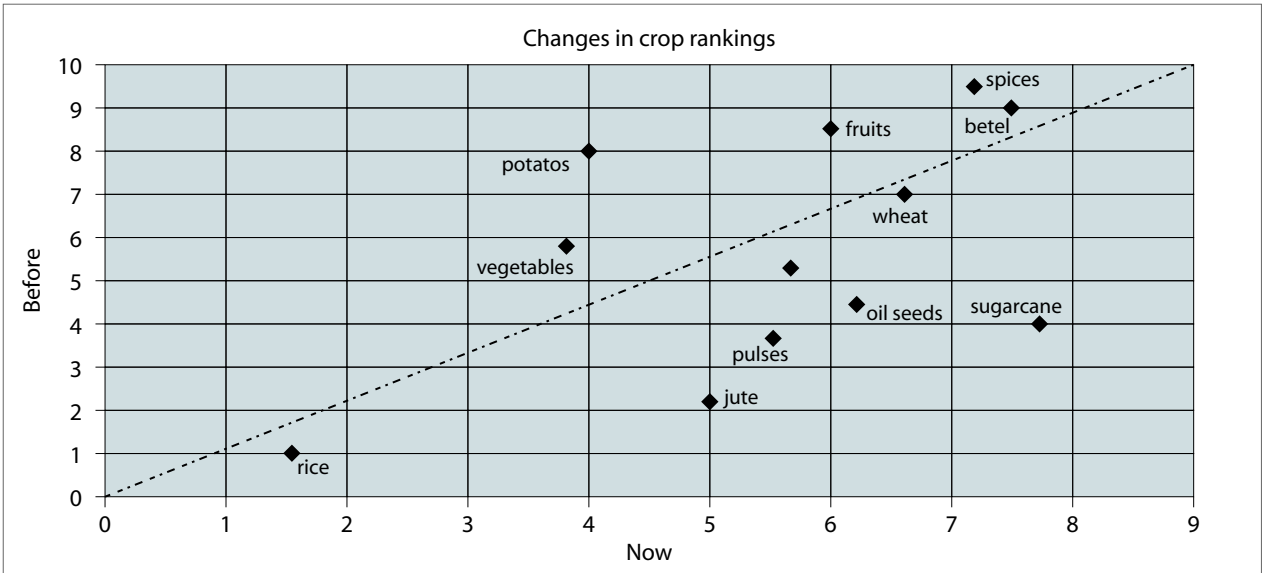
Fruits and vegetables are profitable because of improved transportation facilities and farmers started shifting towards more intensive commercial crops in response to market opportunity… Farmers are gradually shifting towards vegetable (not on the same land) because they incurred loss in paddy caused by water logging problem in the last decade. Vegetable production has increased on 'aus' area as well (Stakeholder analysis report, south-west coastal region, p. 20, 25).

Betel leaf gardening was ranked as second for the present but ten years before it was not cultivated… betel leaf is one of the profitable cash crops and a handsome return can easily be obtained throughout the year. Once cultivated the betel leaf garden continues to give harvest for long time, even for 15-20 years (Stakeholder analysis report, Chuadanga district, p. 13).

At present cabbage/cauliflower are ranked as No. 1 followed by potato, sweet gourd, rice, vegetables, and sesame… In the past rice was the No. 1 crop followed by sweet potato, but with the change of time these crops are less profitable now. The change is reported mainly due to better communication network, market facility and change in the food habit of the people (Stakeholder analysis report, Comilla region, p. 8).

Quantitative evidence from stakeholder meetings also confirms that farmers are changing the crop mix in response to new market opportunities. Villagers were asked to rank the importance of different crops now and from 10-15 years ago. Figure 1 shows that jute, oilseeds, pulses, chillies, and sugarcane have all declined in importance, while there has been a rise in the importance of potatoes, vegetables, betel, fruits, and spices. Rice still remained the highest ranking crop.

Figure 1



Source: Thirteen stakeholder meetings, 10 at village and 3 at district levels

Poverty livelihood diversity and rice

This evidence suggests that PETRRA's exclusive focus on rice does not capture important changes in the structure of the agriculture sector and their impact on the household economy. It makes sense for projects to focus on a single entry-point, like rice. But PETRRA has to recognise that livelihood strategies are increasingly diverse and that increases in household income will not just come from rice. In a diversified farming system the relevant measure of impact is not rice yield per hectare or income from rice, but total household income and total factor productivity.

4. ACHIEVING A POVERTY FOCUS

Although the NAP recognises poverty alleviation as a strategic objective, the links between specific policy issues and poverty are not spelled out. Indeed, most of the literature on agricultural policy has a strong technocratic bias. The World Bank study of crop diversification states:

This study does not assess the impact of diversification on income distribution, employment generation, poverty alleviation, or nutrition status. However, the impacts are likely to be positive (World Bank, 1995).

Similarly, a recent analysis of the livestock sector finds that *poverty alleviation efforts and livestock sector development have actually not been integrated together in policy thinking or action… the thinking in the minds of policy-makers is entirely technocratic and bears little relationship to some of the important social and economic realities* (Asaduzzaman, 2000).

Although new rice technology has proved to be pro-poor, there is no guarantee that the same will be true of the transition to market-oriented agriculture. For market-led growth to be pro-poor, four things are necessary:

- Technology that is scale-neutral and can be profitably adopted by poor households;
- An equitable distribution of land and non-crop resources;
- Efficient input, credit, and product markets so that poor households have access to inputs and information and receive similar prices for their products; and
- Policies that do not discriminate against poor households (e.g., subsidies, scale-

biases in agricultural research and extension).

Raising income from agriculture creates demand for local goods and services, and contributes to the growth of the rural non-farm economy. When incomes increase on small and marginal farms, the proportionate increase in demand for local goods and services is higher than when income increases on large farms (Hossain, 1987). In Bangladesh the rural non-farm sector (including livestock, poultry, and fisheries) now accounts for most of the growth in rural employment. However, this employment is largely in the production of non-tradeables (Mellor, 2000). Hence, growth is dependent on a growing domestic market that, in turn, depends on rising average living standards to create demand. Thus, growth in agriculture and in the rural non-farm sectors are co-dependent and create a 'virtuous circle' that can lift poor households above the poverty line. Households employed in rural non-farm activities have higher incomes than households employed in agricultural labour, suggesting that livelihood diversification is the main pathway out of poverty, *provided that there is continued growth in agricultural productivity to generate demand.*

This highlights the key role played by institutions in giving the transition to market-oriented agriculture a poverty focus. Pro-poor institutions can enable resource-poor households to take advantage of growing, dynamic niches in market-led growth, by supplying services (inputs, credit, knowledge) to poor producers and linking them with product markets. This is particularly true of non-crop agriculture, where there may be significant economies of scale. It is also true of crop enterprises like hybrid rice, where high initial costs may favour larger farmers.

Pro-poor institutions require innovative partnerships between NGOs, private business and the public sector. Such partnerships are beginning to appear in agribusiness, with the use of contract farming by PRAN (exporting fruit juice, vegetables), Aftab (poultry), HORTEX (vegetables) and others. Under this system, companies ensure credit, extension, and technology support to contracted growers and buy back production at pre-determined prices. One example of NGO-public sector partnership is the BRAC poultry model, in which landless households are supplied with layers, vaccines and marketing.

Without such institutions, there is a risk that market-led growth may sometimes exclude or further impoverish resource-poor farmers.

According to the stakeholders potato gave more profit but it required very high investment cost. So, the resource-poor farmers cannot afford to bear that investment cost... (Stakeholder analysis report, Comilla region, p. 18).

Bangladesh shrimp products were not exposed to the international market in the 1980s. The shrimp is more profitable for those who can invest. Increase in salinity area indirectly created an environment in favour of shrimp… The owners of the 'ghers' (shrimp field) captured the poor farmers' land using their influence… 'shapla', 'hogla' - valuable plants for the resource-poor - are decreasing very fast due to increase in shrimp area… The resource-poor are being marginalised because of increasing shrimp cultivation (Stakeholder analysis report, south-west coastal region, p. 26-27).

5. IDENTIFYING POLICY ISSUES

The policy issues identified in this section are derived from several sources. First, the stakeholder reports were reviewed to ensure that PETRRA addressed policy issues that were raised at the village level. Second, a review was made of secondary literature on agricultural policy, particularly the dialogue on *Bangladesh*

Agriculture at the Crossroads. Third, meetings were held with some of the key institutional actors in agricultural policy making in Bangladesh.

Market-led agriculture that is pro-poor: furthering national dialogue

Dr. Mahabub Hossain's presentation, *Bangladesh Agriculture at the Crossroads: Current Challenges*, identified the need to re-think the strategic objective of the agricultural sector in Bangladesh in response to structural changes in the economy, and the achievement of rice self-sufficiency in 1999-2000.

Historically, agriculture policy has been dominated by the need to ensure self-sufficiency in foodgrains, especially rice. Foodgrain self-sufficiency was finally achieved in the late 1990s. The policy framework that produced this Green Revolution (market liberalisation, de-regulation, privatisation) is now broadly accepted. The new challenge is to create an enabling policy environment for the transition to market-oriented agriculture. What needs to happen for farmers to benefit from new opportunities created by the growth of urban and export markets? This requires a new paradigm that takes a broader view about the role of the sector in economic growth and the elimination of poverty.

This suggests the need for further dialogue on agriculture policy. Ideally, this would take the form of a national workshop involving researchers and policy makers. The objective would be to explore what exactly needs to happen for agriculture to meet the projected demand for rice and non-rice crops by 2015, and equally important, how this growth might contribute to meeting the international development target of halving the number of poor people by 2015. To ensure fuller participation, the workshop should consider adopting a more flexible format that used a mixture of papers, plenary discussions, and work in small groups.

One suggestion is that data from the analysis of poverty trends (APT) project be updated (see section below) and used to prepare background reports focusing on specific policy issues. These could be used to facilitate a dialogue with national policy makers. This approach would:

- provide policy-makers with nationally-representative data at the micro-level on which to base discussions about policy changes; and
- allow agriculture policy to be linked more closely to its impact on poverty and poverty trends.

Recommendation: *PETRRA support a national dialogue on agriculture policy.*

Markets, institutions, technology that are pro-poor: specific policy issues

The transition to market-oriented agriculture may be divided into three policy themes. Table 1 summarises the policy issues that were identified under each of these themes and makes recommendations for PETRRA about each issue. The individual issues are discussed in more detail in Appendix 1.

6. GENDER

The transition to market-oriented agriculture has implications for women's productive role. Specialisation will increase opportunities for women to earn income from agriculture. Women are traditionally responsible for homestead-based crops like fruits and vegetables, for livestock enterprises (poultry, cattle and goat rearing), and for post-harvest processing. Hence, research and extension to increase the productivity of these enterprises should not only be demand-driven but also gender-based. Women's demands for agricultural knowledge and services need to be identified, and then

Table 1. Identification of policy issues and recommendations for PETRRA policy studies

Theme	Policy issues	Stakeholder rice-problem rankings (1= highest)	Knowledge gap?	Recommendation for PETRRA	Focus
Market-oriented agriculture that is pro-poor	Commercialisation		Yes	Support national dialogue	Pro-poor market-led growth
Markets that are pro-poor	*Input markets:*				
	Seeds	Seed quality (2)	Yes	Commission research	Seed-sector performance
	Fertiliser	Fertiliser quality (5)	Yes	Continue to support ongoing research	Improving access to quality inputs
	Pesticides	Pesticide quality (5)	Yes	Continue to support ongoing research	Improving access to quality inputs
	Irrigation water	Irrigation (3)	No	No further action	
	Credit	High input costs (4)	No	No further action	
	Draught power	Farm power and labour (4)	No	No further action	
	Land		No		
	Product markets:				
	Domestic markets	Low harvest price of rice (5)	No	No further action	
	Export markets		Yes	Commission research	Market opportunities through WTO
Institutions that are pro-poor	*Demand-driven research system:*				
	Institution building at local level		Yes	Commission research and shared action-learning	Developing workable institutional models at local level
	Institutional change in NARS		Yes	Support national dialogue	How to institutionalise demand-driven research?
	NGO-private-public sector partnerships		Yes	Commission research	Economic growth that is pro-poor
Technology that is pro-poor	*Impact of new rice technology on poverty:*				
	Poverty-trends survey		Yes	Continue to support ongoing research	Technology and graduation from poverty
	Household case-studies		Yes	Commission research	Process aspects of poverty graduation
	Farm-non-farm linkages:				
	Macro level		Yes	Commission research	Economic linkages
	Household level		Yes	Continue to support ongoing research	Livelihood diversification
	Erratic growth in rice production		Yes	No further action	
	Water supply for irrigated rice	Irrigation (2)	Yes	Commission research	Mobilise local institutions for surface water irrigation
	Hybrid rice		Yes	No further action	
	Sustainability	Soils (4)	Yes	Continue to support ongoing research	Arsenic level in rice

met by developing programmes that specifically target women.

Certain policy issues have an important gender dimension. These include: seed-sector performance (seed selection and storage); agri-business (livestock, post-harvest); impact of new rice technology on poverty (do women have control over extra income?); and developing workable institutional models at the local level (how can women make their voice heard in the

public arena?). PETRRA should ensure that the research it commissions on these issues addresses gender roles.

7. PRIORITIES AND SEQUENCING

Priorities

Based on Section 5, priority issues are listed in the Table 2 below. A total of 12 policy issues were identified as high priority for PETRRA. Research on three of these issues is ongoing, leaving nine issues that require commissioning.

Sequencing (see Table 3)

The revised logframe requires that PETRRA's policy studies are commissioned by the end of project year 2 (i.e., September 2001). This seems realistic for most of the policy issues that still require commissioning, with two exceptions. First, it would be more appropriate to hold the national dialogue on demand-driven research after the mid-term review. This would allow the dialogue to be rooted in PETRRA's practical experience of implementation at the local level. At present, experience with demand-driven research is very limited.

Second, policy research on-farm-non-farm linkages at the macro level would benefit from collaboration with the Food Management and Research Support Project (FMRSP) managed by International Food Policy Research Institute (IFPRI). This project is starting a new phase and the timing of its new research programme is not yet clear.

Table 2. Priority policy issues for PETRRA research

No.	High priority	Low priority
Overall policy framework		
1	National dialogue on agriculture policy	Water market
Specific policy issues		
2	Seed sector performance	Draught power and labour
3	Fertiliser and pesticide quality*	Credit market
4	Export markets and WTO	Land market
5	Local institutional models	Product market (domestic)
6	National dialogue on demand-driven research	Erratic trend in rice production
7	NGO-private-public sector partnerships	Hybrid rice
8	Rice technology and poverty	
9	Farm-non-farm linkages: macro level	
10	Farm-non-farm linkages: household level*	
11	Rice irrigation	
12	Arsenic in the food chain*	

Ongoing research commissioned by PETRRA

Table 3. Sequencing of PETRRA policy studies

No.	Immediate (PY2)	Later
Overall policy framework		
1	National dialogue on agriculture policy	
Specific policy issues		
2	Seed sector performance	National dialogue on demand-driven research (after mid-term review)
3	Export markets and WTO	Farm-nonfarm linkages at macro-level (PY 3)
4	Local institutional models	
5	NGO-private-public sector partnerships	
6	Rice technology and poverty	
7	Rice irrigation	

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Appendix 1: Policy issues

Theme: markets that are pro-poor

A1.1. Seed: Stakeholders ranked 'access to quality seed' as the most important problem with rice. De-regulation and liberalisation have made least progress in this area. Rice is a 'notified' crop and imports of seed are controlled, while distribution of multiplied seed is controlled by the parastatal BADC. PETRRA supports a Seed Health Improvement Project (SHIP), and there is a Bangladesh-German Seed Development Project supported by GTZ. A joint research project by IRRI-BRAC is now engaged in an anatomy of the seed sector, with a view to further research at the farm level. **Recommendation:** *PETRRA support further for research on seed sector.*

A1.2. Fertiliser/pesticide quality: Stakeholders ranked access to good quality inputs from trusted agencies as an important constraint on rice yields. Some research suggests that rice yields were being reduced by as much as 30% (Quasem, 2001). Following a research call in January 2000, PETRRA commissioned a research project by BAU-BRRI-NRI on 'Improving access to good quality agri-inputs', with research sites that include two districts in the SW coastal region. **Recommendation:** *PETRRA is already addressing this issue.*

A1.3 Water: Not identified as a priority problem by stakeholders, though some meetings reported irregular supply. This is a well-researched issue and markets for irrigation water are generally competitive (Sattar Mandal, 2000). **Recommendation:** *No further action by PETRRA.*

A1.4 Draught power: Stakeholders identified shortage of labour and farm power as an important production constraint. DFID's Natural Resources Research Programme has supported joint research by BAU-NRI on options for power tillers and draught animals on small farms (ended Oct 2000). **Recommendation:** *No further action by PETRRA.*

A1.5 Credit: Stakeholders identified lack of access to credit as an important constraint that contributed to the high cost of inputs. PETRRA will address this issue as part of its wider effort to develop a workable institutional model for demand-driven research at the local level (see Para 5.16 below). **Recommendation:** *No further action by PETRRA.*

A1.6 Land: Not identified as a priority problem by stakeholders, though some meetings mentioned tenure arrangements as a constraint on production. The 1990s have seen an expansion in the rental market for land and a shift towards cash contracts that give more incentives for tenants. The issue was the subject of a recent report by Zohir (1999). **Recommendation:** *No further action by PETRRA.*

A1.7 Product markets: Stakeholders identified 'low harvest prices' as an important production constraint. Currently, DFID's Natural Resources Research Programme is funding BAU-NRI to conduct research on paddy marketing at the farm level, complementing earlier research on paddy marketing by BAU-IDS. Dr. Jaim (BAU) will integrate the results in a publication later this year. **Recommendation:** *No further action by PETRRA.*

A1.8 Export markets: Bangladesh has a comparative advantage in the production of several agricultural commodities. Trade liberalisation and removal of input subsidies in the 1980s means that agriculture is competitive and can benefit from the WTO's liberalisation of world trade. However, the GOB lacks capacity to take full advantage of these opportunities (Asaduzzaman, 2001). CPD has been instrumental in helping GOB address this policy issue and has invited Mahabub Hossain to prepare a background paper on WTO and agriculture for a policy dialogue to be held later this year. **Recommendation:** *PETRRA support dialogue on WTO and agriculture.*

Theme: Institutions that are pro-poor

A1.9 Demand-driven research: This has both supply and demand aspects. On the demand side, the issue is how to develop an institutional model at the local level that can identify demand for agriculture research and transmit this demand to the relevant service-provider. On the supply side, the issue is how to re-orientate the NARS so that their agenda is driven by their clients' needs.

Local level

PPRC advocates the need for a 'local governance' approach to create institutional 'coalitions' that can provide a forum for identifying research needs at the local level (Rahman, 2001). It plans a programme of action-research in several parts of the country in order to identify a workable institutional model that can then be replicated elsewhere. This is very similar to PETRRA's approach of creating local fora where researchers can interact with local stakeholders to focus on local problems with rice production. Thus, there is scope for PETRRA and PPRC to share lessons and experiences from this action-learning process, and work towards a shared definition of best practice. **Recommendation:** *PETRRA establish a dialogue with PPRC and issue a call for research on institutional aspects of demand for agriculture research at the local level.*

NARS

PETRRA's long-term impact will depend on institutionalising the principles of demand-driven research. This means building consensus on the need for change and creating a system of incentives and rewards for science that has a measurable impact. MOA and BRRI are now more receptive to a demand-driven approach. PETRRA is well placed to facilitate a national dialogue, with IRRI playing a leading role through Mahabub Hossain. However, experience with demand-driven research is still very limited, even in PETRRA. A dialogue today would reflect needs and aspirations rather than lessons or achievements. The case for demand-driven research would be more convincing if it could show results. **Recommendation:** *PETRRA support a national dialogue on creating a demand-driven research system, with participation from NARS, IRRI, and other CGIAR centres, after its mid-term review.*

A1.10 NGO/private sector/public sector partnerships: The transition to market-oriented agriculture usually requires an integrated approach to production, processing, and distribution. This has led to partnerships between NGOs and the private sector, with business supplying technical knowledge and marketing skills and NGOs supplying links with poor producers. For example, BRAC is involved with the production and marketing of hybrid seed, has developed links with agri-business (HORTEX), and runs a successful poultry business. New institutional coalitions thus offer scope for linking poverty reduction with market-led growth. **Recommendation:** *PETRRA support research on new institutional partnerships that reduce poverty.*

Theme: Technology that is pro-poor

A1.11 Rice technology and poverty:

Quantitative

The impact of new rice technology on poverty has been studied through BIDS Analysis of Poverty Trends (APT) project that conducted a 62-village panel survey in 1987 and 1993-84. PETRRA funded a re-survey of 16 villages in 2000 (Hossain et al, 2001) and the remaining 46 villages will be re-surveyed this year (30 villages with funding from PETRRA and 16 with funding from IFPRI). The survey involves collaboration between IRRI and PPRC, with IRRI responsible for the agricultural module. This round of the APT survey can also serve as an

independent baseline survey that can be used to evaluate PETRRA's impact. **Recommendation:** *PETRRA continue to support ongoing research.*

Qualitative

PETRRA's experience of working closely with selected households in focal areas over a five-year period offers scope for research on the processes by which new rice technology reduces poverty. One approach is to use case-study methods that tracks selected households over time. This is ideally suited for exploring qualitative aspects of the impact of rice technology on poverty, (e.g., gender roles, women's empowerment, social networks, and people's perceptions of changes in status). **Recommendation:** *PETRRA issue call for qualitative research on household-level processes of graduation from poverty.*

A1.12 Farm-nonfarm linkages:

Macro- and meso-levels

Discussions showed that this is an important knowledge gap. Current knowledge is based on work done in the 1980s (Hossain, 1987). The explosive growth of the non-farm sector in the 1990s makes it important for policy-makers to understand the dynamics of this process, and its relationship to technology change in agriculture. IFPRI plans to conduct research on this issue during the next phase of the FMRSP project. There is scope for collaboration with IFPRI through joint or complementary research. **Recommendation:** *PETRRA issue call for research on-farm-non-farm linkages.*

Household level

As noted above, household incomes are becoming more diverse. It is important, therefore, for PETRRA to have a livelihoods perspective so that its potential impact on resource-poor households is seen in relation to other sources of household income. Following a call in 2000, PETRRA commissioned a research project by NRI-BRRI on 'Rice and Livelihoods in the Increasingly Diversified Economy of South-west Bangladesh'. The results should give PETRRA a better understanding the place of rice in the livelihood strategies of its target group. This approach would also give useful information about livelihood strategies in other focal areas. **Recommendation:** *PETRRA continue to support ongoing research, and extend research to other focal areas.*

A1.13 Erratic growth in rice production: Discontinuous growth has been a feature of agriculture in Bangladesh, with periodic 'slowdowns' in foodgrain production in the early 1980s and 1990s. Despite intensive study (e.g., CPD, 1998) there is no generally accepted explanation. Analysis at the macro-level is problematic because of the doubtful accuracy of national statistics of rice production. Hossain (2000) suggests production trends reflect a 'cobweb' price cycle, with Nerlovian lags between production and prices. Micro-evidence also suggests that slowdowns may reflect changes in the profitability of irrigated rice (Adnan, 1996). **Recommendation:** *No further action by PETRRA.*

A1.14 Supply of groundwater for irrigated rice: Projected increases in rice supply are critically dependent on irrigation. There are fears that the rapid expansion in irrigation in the 1990s may not be sustainable because a falling watertable will make suction-mode STW's inoperable. Force-mode technology is available but this is expensive and would require some form of joint ownership. The timing and scale of this looming water crisis remain controversial, however. **Recommendation:** *PETRRA issue call for research on prospects for suction-mode irrigation.*

A1.15 Hybrid rice: There is strong support for hybrid rice in the NARS, and PETRRA is supporting BRRI's breeding programme for hybrid rice. But the demand side of the equation needs to be looked at carefully. Hybrid rice in China only took off once the yield gains from

conventional irrigated MVs had been exhausted (Pingali et al, 1997). In Bangladesh, however, there is still significant scope to increase the area under irrigated rice and to narrow the gap between best practice and average yields. An evaluation of hybrid adoption in the 1998-99 *boro* season found that hybrids were more profitable for large farms that could afford the higher investment (Husain et al, nd.). Hence, the direct impact of hybrid rice on poverty seems limited in the short term. **Recommendation:** *No further action by PETRRA.*

A1.16 Sustainability issues: Two concerns related to rice are declining organic matter (OM) in paddy soils, which reduces the response of rice to fertiliser, and high arsenic levels in groundwater following rapid spread of irrigation in the 1990s, which poisons drinking water and may even enter the food chain. PETRRA has commissioned a research project by BRRI on 'Arsenic in the food chain: assessment of the water-soil-crop systems in target areas of Bangladesh' to measure toxicity levels. **Recommendation:** *PETRRA continue to support research on arsenic in the food chain.*

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Stakeholder reports synthesis

Alastair W. Orr, Noel P. Magor and A. Salahuddin

Executive summary

In 1999-2000, Poverty Elimination Through Rice Research Assistance (PETRRA) conducted 10 stakeholder analyses at village, upazila, and district levels to identify priority problems for rice research in Bangladesh. Stakeholders were villagers (including women), research scientists and extension workers.

This report synthesises several issues covered in these stakeholder consultations, in order to provide information for PETRRA's research strategy.

Villagers classified households using a wide range of criteria that are useful in defining PETRRA's target group. An important indicator for this group is provided by the concept of *kine khawa* (purchased rice), indicating the number of months that households relied on market purchases rather than own-farm production. Marginal and small farm households were generally self-sufficient for 3-6 months of the year.

Villagers perceived the benefits from new rice technology not just in terms of higher rice production, income and food security but also in terms of non-income terms, including improved diet, health and children's education. The main cost of new rice technology mentioned by villagers was a decline in soil fertility.

Research priorities identified by stakeholders were grouped and then ranked using median values. Stakeholders gave highest priority to water depth and seed quality (rank 2). Lack of suitable modern varieties, and knowledge of rice cultivation also received high priority (rank 3). Stakeholders gave the lowest priority to problems with soils, pests, quality of inputs, and low harvest prices (rank 5).

Village women gave higher priority than men to problems of knowledge of rice cultivation, farm power and labour. The issue of water depth was associated primarily with the coastal region, while irrigation was an issue in drought-prone environments.

PETRRA's focal areas are representative of the levels of income and non-income poverty that prevail in Bangladesh, and are consistent with its commitment to poverty alleviation.

1. Introduction

PETRRA is a research project whose purpose is to enhance the productive potential of rice-based farming systems in Bangladesh. The goal of the project is to substantially increase domestic rice production and incomes by 2008 such that this contributes towards a 50% reduction in rural and urban poverty by 2015. The five-year, £9.5 million project is managed by the International Rice Research Institute (IRRI) in close partnership with the Bangladesh Rice Research Institute (BRRI).

In 1999-2000 PETRRA conducted 10 consultations at village, upazila and district levels, to allow stakeholders to

DFID Department for International Development

IRRI International Rice Research Institute

Bangladesh Rice Research Institute

identify research problems and ensure that its research programme was demand-driven, rather than determined exclusively by research scientists. Stakeholder meetings were held in 14 villages, representing 13 districts and upazilas, and covering five rice environments (Table 1).

Stakeholder consultations were analysed in a series of 10 stakeholder reports. These reports contain stakeholders' views on a variety of topics, including:

- Poverty indicators;
- Impact of modern varieties (MV) of rice on livelihoods; and
- Priority problems with rice cultivation.

The objective of this report is to synthesise the information on these topics in order that stakeholders' views and priorities are fully reflected in PETRRA's research strategy. The stakeholder reports also contain insights on other topics useful for researchers, but this information has not been analysed here.

2. THE PROCESS OF STAKEHOLDER MEETINGS

Stakeholder consultations followed a carefully designed process. This process was facilitated by the PRA Promoters Society (PPS), a forum for professional facilitators. Persons from PPS trained scientists in participatory methods and also led the facilitation process during the stakeholder consultations.

Research needs were identified through a three-stage process of group meetings at village, district and upazila levels.

- Village meetings were held with groups of resource-poor farmers. Farmers were identified by researchers, usually during transect walks. Meetings were held in 14 villages that were representative of local conditions in the focal areas. Two participatory rural appraisal (PRA) specialists (one male and one female) facilitated the meetings, with scientists playing a passive role as listeners and recorders of information. In five cases, meetings consisted of mixed groups of both men and women, but, in nine villages, meetings were held separately with men and women.
- District meetings were held to provide an independent assessment of research problems. Participants included scientists from BRRI and other national research centres with a local presence, block-level workers of Department of Agricultural Extension (DAE),

Table 1. Stakeholder analyses

No.	BRRI regional station	Stakeholder analysis			
		Village	District	Upazila	Report
1	Kushtia	Kumargara	Kushtia	Kushtia Sadar	Coastal west region
		Hatikata	Chuadanga	Chuandanga Sadar	Chuadanga
2	Satkhira	Setpur	Satkhira	Ashasuni	South-west coastal region
		Bacharer Hula	Bagerhat	Rampal	
		Tipna	Khulna	Dumuria	
3	Comilla	Indraboti	Comilla	Burichong	Comilla
4	Rajshahi	Toilupara	Rajshahi	Tanore	High barind area
		Chimna			
5	Sonagazi	Madya Char Bata	Noakhali	Noakhali Sadar	Maijdi
6	Bhanga	Barra	Faridpur	Bhanga	Bhanga
7	Hobiganj	Gayahori	Hobiganj	Nabiganj	Hobiganj
8	Rangpur	Bahagili	Rangpur	Kaunia	Rangpur
9	Barisal	Islampur	Patuakhali	Kalapara	South-west coastal region
		Araji Kalikapur	Barisal	Babuganj	
Total	**9**	**14**	**13**	**13**	**10**

and non-governmental organisations (NGOs). Farmers also attended the meeting but these were selected by DAE and drawn from different extension blocks in the districts, not from those who had participated in village meetings.

Upazila meetings were held to reach a consensus on the research problems identified at the village and district levels. Participants included scientists from BRRI and other research centres, upazila-level DAE workers and NGOs. Farmers from the original village meeting also attended.

3. TARGET GROUPS AND POVERTY INDICATORS

The stakeholder analyses provide a picture of the various social groups found in the focal areas (Table 2). These classifications have been used to provide a composite picture that can help identify an appropriate client group. The advantage of this classification is that it is rooted in village reality. Since the indicators are those used by villagers themselves, they may also be practical for use by field-based research programmes.

Villagers classified households using a wide range of criteria, including land ownership, tenure status, assets, food security, and sources and level of income. Although the range of land ownership is small, with the majority of farmers cultivating holdings of 1 hectare or less, there are important differences between social groups. There is a world of difference between a household that relies on income from wage-labour and sharecropping and one that cultivates its own land, hires labour and is food secure for all but a few months of the year. Households in different groups have different needs, aspirations and potential. PETRRA therefore needs to identify the most appropriate target group for its research activities.

Table 2. Composite indicators for poverty sub-groups

Indicator	Landless	Marginal	Small	Medium	Rich
Bengali names	*Bhitahin, Dinmajur*	*Gorib, Kono rokom, Mutamuti, Borga chashi*		*Moddhom, Modhyabitta, Majhari*	*Dhoni*
Land ownership	Homestead only	Homestead + cultivated land	Homestead + cultivated land	Homestead + cultivated land	Homestead + cultivated land
Tenure status	Nil	May sharecrop land	Sharecrops land and cattle	Nil	Rents out land to sharecroppers
Assets	Nil	Nil	Nil	Power tiller, irrigation pump, tin-roofed house	Power tiller, irrigation pump, tin-roofed house with cement walls, or house in town
Farm income	Poultry, livestock	Poultry, livestock, rice	Poultry, livestock, rice	Poultry, livestock, rice, betel leaf garden	Poultry, livestock, rice, fish pond or big pond
Non-farm income	Labour (including children and women), begging	Labour, rickshaw van	Small business, rice mill	Small business, service income	Business or retail shop, remittance from family members abroad
Rice deficit (months)	12 or 11 if glean from others' land 'sometimes starve'	9 + 'most of the time have 2 meals a day'	6-8 'have 2 meals a day during crisis period'	Self-sufficient or surplus 'take 3 full meals a day'	Surplus 'take 3 full meals a day'
Access to credit	Nil	Moneylender	Bank, NGO or micro-credit	Not known	Not known
Income (Tk./month)	700-800	800-1,500	1,500-2,500	2,500-4,000	Not known
Savings (Tk./month)	Nil	Nil	200	500	Not known

Source: PETRRA stakeholder analyses

The household food security indicator is particularly powerful since it takes account of differences in land quality and productivity. Two indicators are available:

- *Kine khawa*, or the number of months that a household is able to buy rice, is a poverty indicator that is widely used by villagers. It is often used as a proxy for wealth.
- Rice provision ability (RPA) measures household food security by valuing the household's gross rice production at market prices, converting household members into adult equivalents, and then estimating the number of months the household was self-sufficient in rice at a rate of 1 kg. per day per adult equivalent given current market prices. NGOs like MCC have used this indicator to target their agricultural research programmes and measure the impact of these programmes on household food security. BRRI used a similar indicator in its study of small farmer vulnerability in the early 1990s.

4. IMPACT OF NEW RICE TECHNOLOGY

Villagers drew diagrams illustrating the positive and negative results of increased rice production.

Direct benefits included income, rice production and household food security (Table 3). Villagers also identified indirect benefits or second-order changes on non-income dimensions of poverty. These included better diet and health and more children going to school. Villagers therefore perceive that rice technology has a broader impact on poverty than suggested by simple increases in production and income. Improved knowledge and skills will also be an important benefit, particularly for women who have had little exposure to agricultural extension.

The stakeholder analyses show that villagers were well aware of the adverse environmental impact of new rice technology. According to the villagers, the most important negative impact was a decline in soil fertility. Of the 11 villages, in which this exercise was conducted, nine mentioned this problem. Villagers also emphasised a lack of biomass for fodder and livestock (creating a shortage of organic manure), higher pest attacks, a decline in fish stocks, and the risk to human health posed by pesticides. This suggests that farmers will be receptive to technology that counters damage to the environment. Attention must also be given to environmental problems that have been identified by researchers, particularly arsenic contamination in groundwater.

Table 3. Villagers' perceptions of impact of new rice technology

Positive impacts

(Number of villages reporting)

Impact	1	2	3	4	5	6	7	8	9	10	11
Higher rice production	■	■	■	■	■	■	■	■	■	■	■
Higher income	■	■	■	■	■	■	■	■	■	■	
Children go to school	■	■	■	■	■	■	■	■			
Higher savings and investment	■	■	■	■	■	■	■	■			
Improved diet and health	■	■	■	■	■	■					
More employment	■	■	■	■							
Lower rice prices	■	■									

Negative impacts

(Number of villages reporting)

Impact	1	2	3	4	5	6	7	8	9	10	11
Decline in soil fertility	■	■	■	■	■	■	■	■	■		
Higher production costs	■	■	■	■	■	■	■				
Shortage of grazing and fodder for livestock	■	■	■	■	■	■	■				
More pest attacks	■	■	■	■	■						
Pesticide hazard to humans and livestock	■	■	■	■	■						
Decline in fish stocks	■	■	■	■	■						
Greater need for credit	■	■	■	■							
Decline in area planted to other crops	■	■	■								

5. RESEARCH PRIORITIES

Methods

To produce a synthesis, individual problems and their ranking were entered in a database for analysis. The database allows research problems to be stratified by level of consultation, gender, and the rice environment (see Appendix Tables A1-3 for these data).

Average values of ranks were calculated for each problem. To reduce the variation in ranks, the analysis was restricted to problems ranked 10 or below. Even so, the mean value for each problem showed high variation. Research problems were therefore ranked using the median value. In interpreting these results, it should be remembered that they are not equally weighted for each focal area. Five focal areas had only one set of meetings (village, district and upazila) but three areas had two sets of meetings and one area had three. Moreover, in villages, where male and female groups identified problems separately, the problems were over-represented since they were entered separately into the database.

After a preliminary examination of the data, research problems were combined into 13 problem groups (see Table 4).

Table 4. Problem sub-group and associated issues

Problem code	Problem sub-group	Problems mentioned
1	soils	low fertility, high salinity, lack of soil testing facilities
2	input costs	high input costs, low profitability, lack of access to credit, lack of capital
3	knowledge of modern variety cultivation	lack of knowledge of modern rice cultivation exposure
4	pests	insect pest, incidence of disease and weeds
5	quality of inputs	adulterated fertiliser and pesticides
6	irrigation	lack of irrigation, late irrigation
7	seed quality	poor seed quality, poor seed storage
8	lack of suitable modern varieties	lack of suitable modern varieties (e.g., lack of salt tolerance or lack of drought tolerance)
9	low market price	low harvest price of paddy
10	natural hazards	flash-floods, hailstorm, sudden cold
11	farm power and labour	lack of draught power, labour shortage
12	water depth	excess water, stagnant water
13	others	inadequate infrastructure, inadequate extension, unfavourable land tenure

Villager's priorities

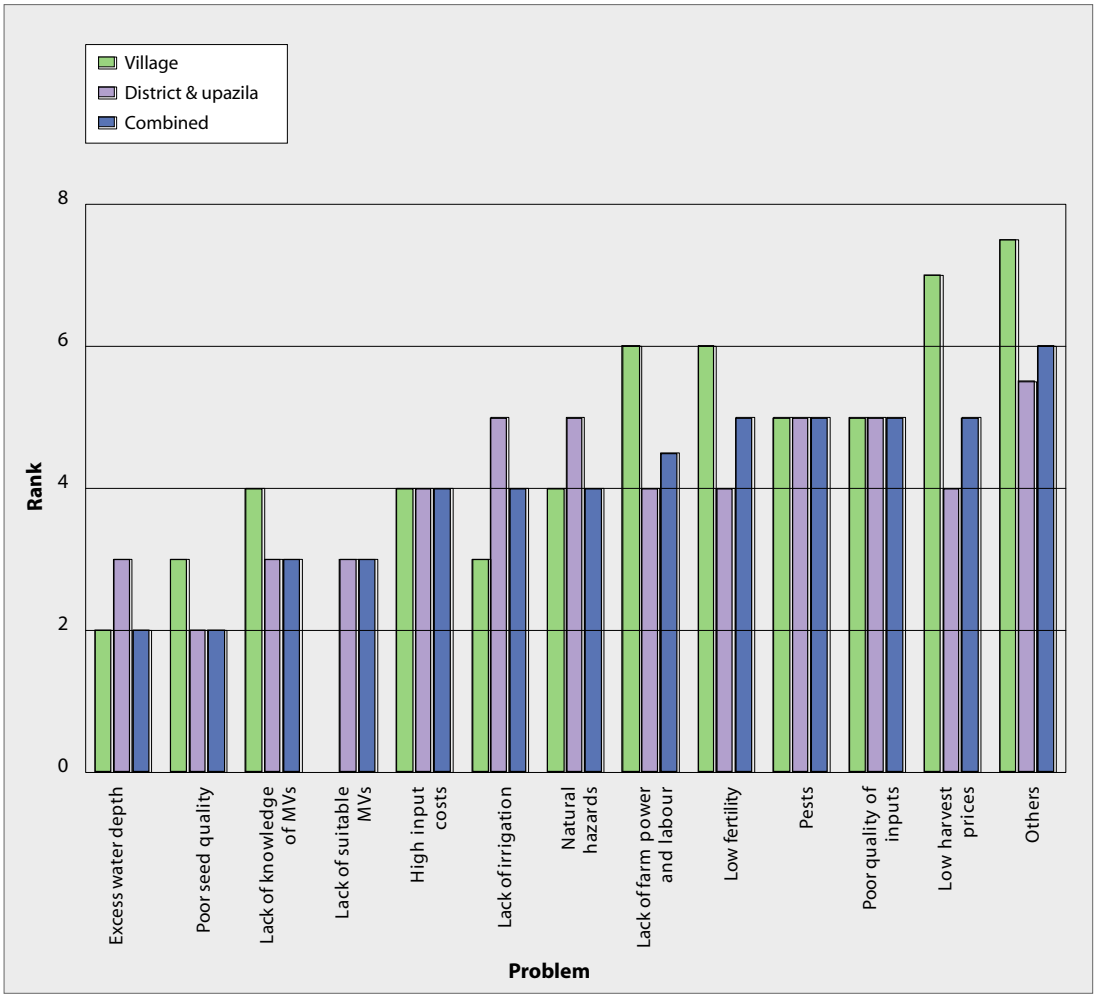
Figure 1 shows that village meetings gave high priority to issues concerned with water depth (rank 2), irrigation and seed quality (rank 3). They also ranked lack of knowledge of modern rice cultivation on the same level as 'high input costs' (rank 4). Other issues of concern to researchers, such as pests attack or quality of inputs, were given medium rankings by villagers. Villagers gave least importance to low harvest prices, which had a rank of 7.

Villagers did not recognise a lack of suitable modern varieties as a research problem. However, the high priority they gave to the issue of water depth reflects their concern about high water levels in the coastal saline and tidal wetland rice environment. This prevents the cultivation of the modern varieties in the main monsoon season *(aman)*, since the modern varieties of transplanted *aman* that are presently available are not sufficiently flood resistant or salinity tolerant. Thus, the issue of water depth can also be seen as one of the lack of suitable modern varieties.

Combined villagers' and researchers' priorities

Combining problem rankings from the village, district and upazila meetings gives a slightly different ordering from that identified at the village level (Figure 1). The issue of water depth remains the top priority, but seed quality displaces irrigation as the second-highest priority. Irrigation has a combined rank of 2. Suitable modern varieties (not recognised

Figure 1. Average problem rankings *(1= Highest)*



as an issue by farmers) moves up to become one of the top four research priorities. Low harvest prices, which villagers gave a rank of 7, now has a rank of 5 that gives it equal importance to issues such as soils and pests.

Table 5 compares the rankings for research problems at the village level with those at the combined level (village + district + upazila). Problems that lie on the shaded diagonal had identical rankings. Problems that lie above the shaded diagonal were ranked higher by villagers, while problems below the shaded diagonal were ranked higher by researchers. Generally, all the problems lie on or close to the diagonal, indicating congruence between results at the village and upazila levels. The exception (as noted above) was with the problem 'lack of suitable modern varieties' which farmers did not recognise as a problem. They did, however, give high priority to the issue of water depth in the *aman* season, which partly reflects the lack of a suitable modern variety for coastal and tidal regions.

Women's priorities

PETRRA's stakeholder analyses identified research opportunities to address women's constraints (Appendix Table A2). Male and female groups gave identical rankings to the issues of seed quality (3) and high input costs (4). Two important differences emerged, however.

- Women did not recognise the same problems as men. The issue of water depth, quality of inputs and soils did not figure on their list of problems; and

Table 5. Comparison of village-level and combined problem rankings

(median ranks, 1 = most important)

Village ranking	Anticipated PETRRA impact								
	1	2	3	4	5	6	7	8	Not ranked
1									
2		Excess water depth							
3		Poor seed quality		Lack of, or late irrigation					
4			Lack of knowledge of MVs cultivation	High input costs, natural hazards					
5				Farm power and labour	Pests, lack of quality of inputs, low fertility				
6					Low harvest prices				
7									
8						Other problems			
Not ranked			Lack of suitable MVs						

- Women gave higher ranks to the problems of lack of knowledge of modern variety cultivation (which they gave a rank of 3) and to shortages of farm power and labour (which they gave a rank of 4).

These differences reflect women's gender role in rice production and their limited contact with agricultural extension, which is usually directed at men. A full description of research opportunities to address women's constraints is given in the gender strategy document that is part of this series.

Research priorities and rice environment

To identify regional differences, problem rankings were made according to rice environment. The rice environment was taken to be that of the BRRI regional station nearest to where the stakeholder analysis was conducted (see Figure 2 and Table 6). The raw data for problem ranking by rice environment are given for reference in Appendix Table A3.

Incidence of problems

Of ten research issues identified by stakeholders, four were found in all six rice environments (Table 7). These were:

- seed quality;
- high input costs;
- lack of knowledge of MV cultivation; and
- irrigation.

The issue of water depth was not mentioned as a problem in the drought-prone or lowland rice environments, and was ranked as the least important problem in the irrigated rice environment.

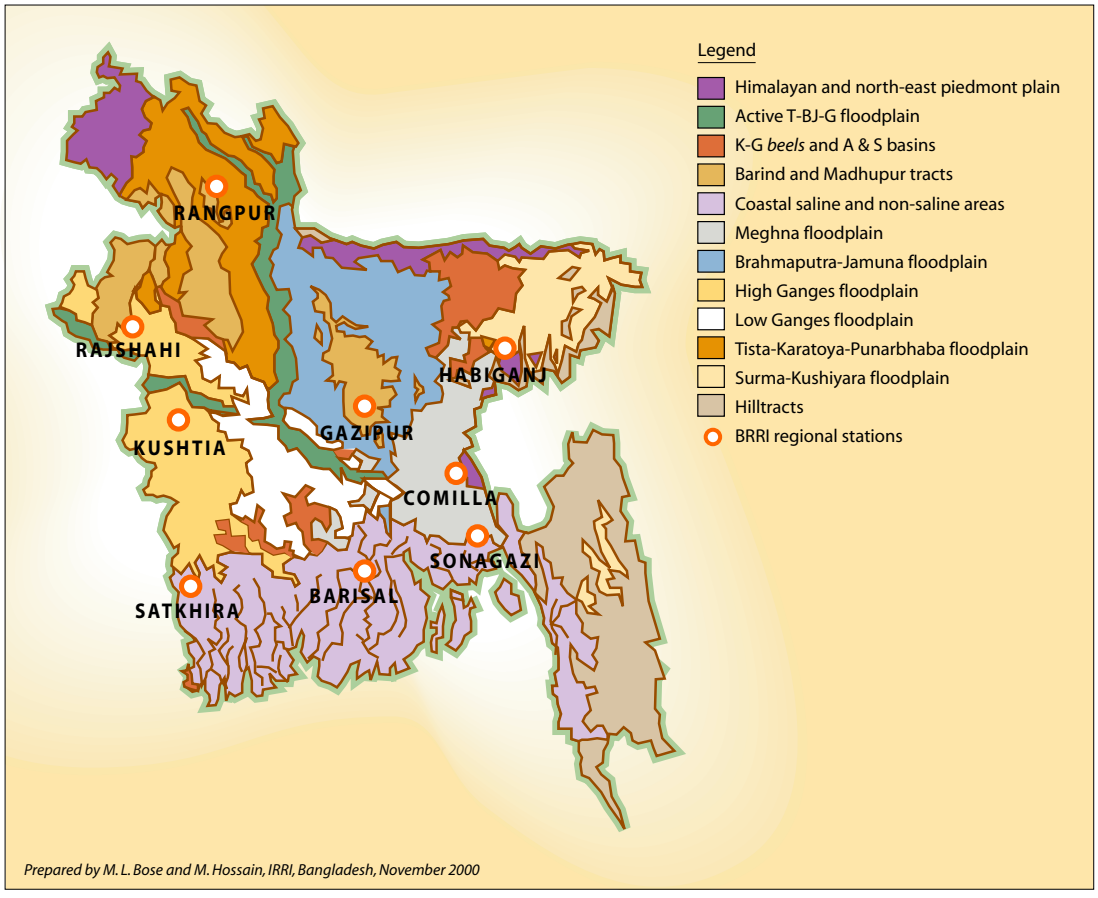
The high overall rank given to water depth reflects the large number of stakeholder consultations held in the coastal saline region. Of ten stakeholder reports, three were conducted in coastal areas (south-west coastal region, south-central coastal region and south-east coastal region).

The problem of a lack of suitable modern variety, which was mentioned in

Table 6. Combined problem rankings: by rice environment

Problem	Stakeholder analysis						
	All environments	Irrigated	Coastal	Flood-prone	Upland	Drought-prone	Lowland
Excess water depth	2	9	2	4.5	4.5	–	–
Poor seed quality	2	2	3	2	2.5	5.5	1
Lack of knowledge of MVs cultivation	3	5	4	5	5.5	2.5	3
Lack of suitable MVs	3	–	3	2	4	4	4
High input costs	4	3.5	4	2	6	5	4.5
Lack of irrigation	4	5	4	4	4	7	3.5
Natural hazards	4	9	3	3.5	–	4	–
Lack of farm power and labour	4.5	6	4	3	6	–	–
Low fertility	5	–	5.5	5	8	6.5	4
Pest attacks	5	4	5.5	4	3.5	–	8
Poor quality of inputs	5	5	–	–	4.5	7	5
Low harvest prices	5	4.5	7	4.5	–	–	6
Other problems	6	8.5	6	5.5	6.5	–	–
No. of responses	**395**	**55**	**144**	**77**	**36**	**35**	**48**

Figure 2. BRRI regional stations located in different agroecological zones in Bangladesh



four rice environments, did not appear as a problem in the irrigated rice environment. This is self-explanatory, since most modern varieties have been developed specifically for this rice environment.

Table 7. Village-level problem rankings: by gender

(median ranks, 1 = most important)

Ranking by all male village groups	Ranking by all female village groups								
	1	2	3	4	5	6	7	8	Not ranked
1									
2			Lack of irrigation						
3			Poor seed quality						Lack of suitable MVs, excess water depth
4				High input costs, natural hazards	Insect pest attacks				
5			Lack of knowledge of MVs cultivation						Poor quality of inputs
6									
7				Lack of farm power and labour		Low harvest prices			Low fertility, other problems
8									
Not ranked									

Quality of inputs, mentioned as a problem in four rice environments, was not mentioned in the coastal or flood-prone environments. This may reflect the low adoption of modern variety rice in these less favourable areas.

The issues of soils and pests were mentioned as problems in five of six rice environments, though they were given a relatively low rank overall (rank 5) (see Appendix Table A2). Interestingly, soils were not mentioned as an issue at all in the irrigated rice environment, where adoption of modern variety rice has been highest and where problems with soil degradation and fertility have received attention from rice scientists.

Problem rankings

Water depth, poor seed quality, lack of knowledge of modern variety cultivation, and lack of suitable modern varieties were four issues that received the highest rankings. In the rice environments where these problems were mentioned, rankings were similar. The exception was the issue of water depth, which received a low rank of 9 in the irrigated rice environment. With this exception, no other examples were found of wide differences in issue ranking between rice environments. The main difference between environments lay in whether issues were mentioned, rather than the order in which they were ranked.

6. FOCAL AREAS AND POVERTY INDICATORS

Table 8 shows the available poverty measures for each of the districts where stakeholder analyses were conducted. The measures include:

- A composite poverty index that combines income poverty with human development indicators;
- Level of income poverty (per capita income); and
- The World Food Programme's (WFP) index of food insecurity that also takes account of other indicators such as agricultural wage rates, access to land, employment, the share of households headed by women, and female literacy.

Table 8 shows that:

- The share of districts in the focal areas with high human and income poverty (i.e., scoring low or very low on the composite poverty index) is higher than the national average (31%, compared with the national average of 42%);
- The share of districts in the focal areas with high income poverty (i.e., scoring low or very low on the income poverty index) is the same as the national average (41%, compared with the national average of 42%); and
- An above-average share of districts in the focal areas falls into the category of very high food insecurity (38%, compared with the national average of 25%).

PETRRA's choice of focal areas is also consistent with its commitment to make an impact on poverty. In terms of the most commonly used poverty criteria, therefore, the choice of focal sites is appropriate. They are not unrepresentative and provide an appropriate environment to show how rice research can raise incomes among resource-poor farmers.

Table 8. Focal areas and poverty indicators

No.	BRRI regional station	Rice environment	Agro-ecological zone	Districts	Income poverty index (IPI)	Composite poverty index (HPI + IPI)	Relative food insecurity (WFP)
1	Barisal	Coastal saline and tidal wetlands	Ganges tidal floodplain	Patuakhali	Low	Low	Low
				Barisal	High	High	Low
2	Satkhira	Coastal saline and tidal wetlands	Ganges tidal floodplain	Satkhira	High	Average	Moderate
				Bagerhat	Low	Average	Very high
				Khulna	Average	Average	Moderate
3	Sonagazi	Coastal saline	Lower meghna river floodplain	Noakhali	Low	Low	Low
4	Kushtia	Irrigated	High ganges river floodplain	Kushtia	Very low	Low	Very high
				Chuadanga	Low	Average	High
5	Comilla	Irrigated	Old meghna estuarine floodplain	Comilla	Average	Average	Low
6	Bhanga	Flood-prone		Faridpur	Average	Average	Very high
7	Hobiganj	Flood-prone		Hobiganj	Average	Average	Very high
8	Rajshahi	Drought-prone		Rajshahi	High	Average	Very high
9	Rangpur (north-west)	Rainfed lowland	Northern piedmont plain	Rangpur	Very low	Very low	High

Notes: IPI = Income poverty index; HPI = Human poverty index; WFP = World Food Programme; Low poverty index = High incidence of poverty and vice versa

Appendix

Table A1. Data for average problem rankings: by level of consultation

Problem	Village				District and upazila				Combined			
	Mean	Median	Frequency	Percent	Mean	Median	Frequency	Percent	Mean	Median	Frequency	Percent
Low soil fertility	5.9	6.0	11	6.1	4.5	4.0	16	7.4	5.1	5.0	27	6.8
High input costs	4.3	4.0	36	20.1	4.3	4.0	34	15.7	4.3	4.0	70	17.7
Lack of knowledge of MVs	4.1	4.0	19	10.6	3.7	3.0	29	13.4	3.8	3.0	48	12.2
Pests	4.8	5.0	19	10.6	5.3	5.0	12	5.6	5.0	5.0	31	7.8
Poor quality of inputs	6.0	5.0	3	1.7	6.9	5.0	10	4.6	5.2	5.0	13	3.3
Lack of irrigation	3.5	3.0	18	10.1	4.7	5.0	21	9.7	4.2	4.0	39	9.9
Poor seed quality	3.4	3.0	23	12.8	2.5	2.0	21	9.7	3.0	2.0	44	11.1
Lack of suitable MVs	–	–	2	1.1	3.0	3.0	20	9.3	3.0	3.0	22	5.6
Low market prices	6.6	7.0	8	4.5	4.5	4.0	11	5.1	5.4	5.0	19	4.8
Natural hazards	4.4	4.0	11	6.1	5.3	5.0	8	3.7	4.7	4.0	19	4.8
Shortage of farm power and labour	5.1	6.0	9	5.0	4.1	4.0	7	3.2	4.7	4.5	16	4.1
Excess water depth	3.2	2.0	10	5.6	4.6	3.0	7	3.2	3.8	2.0	17	4.3
Others	7.0	7.5	10	5.6	5.2	5.5	20	9.3	5.8	6.0	30	4.6
Total	**4.5**	**4.0**	**179**	**100.0**	**4.2**	**4.0**	**216**	**100.0**	**4.3**	**4.0**	**395**	**100.0**

Table A2. Data for average problem rankings: by gender

Problem	All male groups				All female groups			
	Mean	Median	Frequency	Percent	Mean	Median	Frequency	Percent
Low soil fertility	7.0	7.0	5	6.8	–	–	–	–
High input costs	4.6	4.0	16	21.9	4.4	4.0	8	17.8
Lack of knowledge of MVs	4.5	5.0	8	11.0	3.0	3.0	5	11.1
Pests	3.8	3.5	8	11.0	5.4	5.0	5	11.1
Poor quality of inputs	5.0	–	1	1.4	–	–	–	–
Lack of irrigation	3.2	2.0	9	12.3	2.8	2.5	4	8.9
Poor seed quality	2.9	3.0	9	12.3	3.4	3.0	7	15.6
Lack of suitable MVs	3.0	–	1	1.4	–	–	–	–
Low market prices	7.7	7.0	3	4.1	6.3	6.0	3	6.7
Natural hazards	3.5	3.5	2	2.7	3.8	3.5	6	13.3
Shortage of farm power and labour	6.5	6.5	2	2.7	4.0	4.0	5	11.1
Excess water depth	3.2	3.0	5	6.8	2.0	–	1	2.2
Others	6.3	7.0	4	5.5	5.0	–	1	2.2
Total	**4.4**	**4.0**	**73**	**100.0**	**4.0**	**4.0**	**45**	**100.0**

Table A3. Data for average problem rankings: by rice environment

Problem	Irrigated				Coastal saline and tidal				Flood-prone			
	Mean	Median	Frequency	Percent	Mean	Median	Frequency	Percent	Mean	Median	Frequency	Percent
Low soil fertility	1.0	–	3	5.5	5.3	5.5	14	9.7	5.0	5.0	2	2.6
High input costs	4.7	3.5	12	21.8	4.1	4.0	25	17.4	3.2	2.0	13	16.9
Lack of knowledge of MVs	4.6	5.0	5	9.1	3.3	4.0	13	9.0	4.2	5.0	9	11.7
Pests	4.3	4.0	7	12.7	6.0	5.5	6	4.2	4.3	4.0	7	9.1
Poor quality of inputs	4.7	5.0	3	5.5	6.0	–	1	0.7	–	–	–	–
Lack of irrigation	4.2	5.0	5	9.1	3.7	4.0	14	9.7	3.8	4.0	10	13.0
Poor seed quality	1.8	2.0	4	7.3	3.1	3.0	16	11.1	2.3	2.0	11	14.3
Lack of suitable MVs	3.0	–	1	1.8	2.9	3.0	8	5.6	2.0	2.0	5	6.5
Low market prices	5.0	4.5	4	7.3	7.0	7.0	6	4.2	4.5	4.5	4	5.2
Natural hazards	8.3	9.0	3	5.5	4.2	3.0	9	6.3	3.3	3.5	4	5.2
Shortage of farm power and labour	6.0	6.0	2	3.6	4.1	4.0	7	4.9	3.0	3.0	2	2.6
Excess water depth	9.0	9.0	2	3.6	1.8	2.0	10	6.9	4.5	4.5	2	2.6
Others	7.5	8.5	4	7.3	5.3	6.0	15	10.4	5.1	5.5	8	10.4
Total	**4.8**	**4.0**	**55**	**100.0**	**4.1**	**4.0**	**144**	**100.0**	**3.6**	**3.0**	**77**	**100.0**
Problem	**Upland**				**Drought-prone**				**Lowland**			
	Mean	**Median**	**Frequency**	**Percent**	**Mean**	**Median**	**Frequency**	**Percent**	**Mean**	**Median**	**Frequency**	**Percent**
Low soil fertility	8.0	8.0	2	5.6	6.5	6.5	2	5.7	5.3	4.0	4	8.3
High input costs	5.6	6.0	5	13.9	4.3	5.0	7	20.0	5.4	4.5	8	16.7
Lack of knowledge of MVs	5.5	5.5	2	5.6	3.3	2.5	8	22.9	3.8	3.0	11	22.9
Pests	3.3	3.5	6	16.7	8.0	–	1	2.9	7.5	8.0	4	8.3
Poor quality of inputs	4.3	4.5	4	11.1	6.7	7.0	3	8.6	5.0	5.0	2	4.2
Lack of irrigation	4.8	4.0	4	11.1	7.0	7.0	2	5.7	4.5	3.5	4	8.3
Poor seed quality	2.8	2.5	4	11.1	5.5	5.5	4	11.4	3.4	1.0	5	10.4
Lack of suitable MVs	4.0	4.0	2	5.6	4.0	4.0	3	8.6	3.3	4.0	3	6.3
Low market prices	–	–	–	–	3.0	–	2	5.7	5.7	6.0	3	6.3
Natural hazards	–	–	–	–	4.0	4.0	2	5.7	6.0	–	1	2.1
Shortage of farm power and labour	6.3	6.0	3	8.3	7.0	–	1	2.9	2.0	–	1	2.1
Excess water depth	4.5	4.5	2	5.6	–	–	–	–	10.0	–	1	2.1
Others	6.5	6.5	2	5.6	–	–	–	–	10.0	–	1	2.1
Total	**4.8**	**5.0**	**36**	**100.0**	**5.0**	**–**	**35**	**100.0**	**4.9**	**5.0**	**48**	**100.0**

Suggested citation:

Orr, A. W., Magor, N. P. and Salahuddin, A. 2007. Stakeholder reports synthesis. In: Magor, N. P., Salahuddin, A., Haque, M., Biswas, T. K. and Bannerman, M., editors. PETRRA – an experiment in pro-poor agricultural research. Strategy brief no. 2.3. Dhaka (Bangladesh): Poverty Elimination Through Rice Research Assistance Project, International Rice Research Institute. 12 p.

Environmental management strategy

Mark A. Bell

Background

Research and development workers have become increasingly aware of the dynamic interaction between human activities and the environment. While some agricultural activities can be considered environmentally benign, others can either enhance or damage the environment. Responsible research and development will constantly assess its potential impact on the environment and, where there is doubt, take precautionary steps to ensure the protection of our natural systems.

Agricultural activities can have direct effects (e.g., pesticide effects on humans and fauna and flora) or indirect effects (i.e., effects out of the paddy- e.g., through food chain, groundwater, or siltation, etc.). Activities affect the quality or quantity of the basic environment resources of soil, water and air. Potential effects of agriculture include: decreases or savings in the amount (quantity) of available water (e.g., through implementation of water saving technologies or increased water losses due to greater water infiltration), losses or gains in terms of drinking water quality, losses or gains in soil health (quality), increased or decreased erosion (quantity), problems of air quality (e.g., straw burning), increases or losses in terms of food quality (e.g., genetically modified organisms [GMOs] may increase or decrease quality) and food quantity.

The potential pathways for the effect of agriculture on the environment allow ready identification of the type of monitoring that may be required if effects are deemed probable. It is not proposed that all activities be monitored, but rather, that best practices in terms of evaluating potential effects are followed.

Environmental goals and objectives

The overall goal of the environment strategy[1] is 'to ensure that project activities are environmentally friendly.'

The overall objective of the Poverty Elimination Through Rice Research Assistance (PETRRA) environmental strategy is 'to provide a clear guide for PETRRA and its partners on the needs and means to preserve the environment and to contribute to sustainable development while pursuing the goals of PETRRA.'

The specific objectives are:

- Integration of and compliance with environmental management standards into project activities;
- Partner buy-in to sound environmental management for long term commitment to environmental protection; and
- Human capacity development to assess and promote sound environmental management as a natural part of agricultural research and development activities.

Sustainability

Sustainability of this effort will only be

[1] *A strategy is defined as 'a scheme for achieving an objective' (Webster's encyclopedic dictionary)*

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The strategy to achieve these objectives includes:

Objective	Planned actions
Integration & compliance	• Environmental assessment of the potential impact of activities at the CN and Sub-project (SP) activity levels in the form of checklists; • The annual review of projects will include reference to environmental implications (either positive or negative); • The project M&E unit will include environmental checklists and questions to farmers on observations about technologies and their effects on their environment; • Public recognition of partners promoting environmentally sound R&D; • Documentation of key GOB environmental requirements; • The inclusion of environment in policy dialogues and activities; and • Link to environmental organisations to ensure that latest knowledge and trends are available to project monitoring staff.
Partner buy-in	• Build-in awareness raising of the positive and negative impacts of environmental management in all project activities; and • Public recognition of partners promoting environmentally sound R&D.
Capacity building	• Document key potential interaction points of technology and the environment- and how these can be best managed for positive environmental impact; • Identify key partners to help promote environmental awareness and the benefits of sound management; and • Develop capacity of key collaborators in terms of awareness of GOB policy, potential impacts and benefits of sound environmental management, monitoring requirements and primary considerations.

achieved if participants become convinced through personal experience of the benefits of protecting their environment. Constant awareness raising of environmental considerations will allow project participants to become familiar with key environmental aspects of their work and the potential benefits and problems. The key to awareness raising will be the inclusion of an environmental checklist during the development, implementation and evaluation of all sub-project (SP) activities.

Training needs

Awareness will be the primary criteria for training. As most project participants have

Environmental effects can be positive or negative, direct or indirect, quantitative or qualitative

Activity may affect	Production factor	Water		Soil		Air	Food		Human/ Fauna direct
		Qty	Qlty	Qty	Qlty	Qlty	Qlty	Qty	
	Tillage								
	Crop establishment								
	Variety								
	Water management								
	Pest management								
	Weeds								
	Insects								
	Diseases								
	Nutrient management								
	Harvest								
	Thresh								
	Dry								
	Storage								
	Milling								
	Marketing								
	Straw management								
	By product use/disposal								

Qty - Quality; Qlty - Quantity

biological training it is expected that they will already have a basic understanding of the potential interactions between the environment and agriculture. Basic environmental seminars will be given to reviewers and monitoring and evaluation (M&E) staff to highlight, which factors need to be considered.

If required, the following provides a summary of potential monitoring variables

Aspect		**Monitoring options**
Water	Quality	EC, pH, nutrient levels, contaminants, soil suspended, taste
	Quantity	Total available, amount used, siltation (from soil deposition)
Soil	Quality	EC, pH, SOM, nutrient levels, contaminants
	Quantity	Soil loss, deposition
Air	Quality	Particulate, CO_2, CH_4

Suggested citation:

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Gender strategy

Thelma R. Paris

Executive summary

Rural women in Bangladesh contribute significantly to the agricultural economy and household food security. Selecting, cleaning, storing rice seeds, dehusking paddy, parboiling rice, and sun drying, are traditional roles of women. Aside from rice post-harvest activities, they are engaged in economic activities such as rearing goats and poultry, milking dairy animals, making cow dung cakes for household fuel, and growing vegetables in their homesteads. For a long time, non-governmental organisations (NGOs) such as the Bangladesh Rural Advancement Committee (BRAC), Proshika, CARE, etc. have been undertaking successful micro-credit and development programmes targeting the ultra-poor and landless women to alleviate their poverty.

However, rice research and extension programmes have neglected to pay explicit attention to the roles, constraints and technology needs of poor women engaged in rice production and post-harvest activities. This is due to the perception that these activities which are done within the homestead are extension of household tasks and are not part of agriculture. This perception automatically excludes women as participants in on-farm research, training and extension programmes. The participation of farmers, especially women, in technology development and uptake is vital for achieving positive impact on poor people.

This document sets out a strategic plan to ensure that the project Poverty Elimination Through Rice Research Assistance (PETRRA) addresses the needs and constraints of both men and women in increasing productivity and in setting research priorities, particularly in areas where they play major roles and contribute to decision making.

The goal of this gender strategy is to give women equal importance with men in setting research priorities, participating in technology development, and evaluating impact on rice production and income.

The five areas wherein gender will be incorporated are:

- technology development;
- enhancing capacity for demand-led research;
- uptake pathways;
- policy; and
- impact.

This gender strategy plan is divided into the following: a) introduction; b) purpose and philosophy of PETRRA project; c) research partners; d) gender strategy and its goals; e) action plan for mainstreaming gender concerns into PETRRA's projects at different levels; and f) guidelines for incorporating gender concerns in the research and uptake stages of PETRRA's funded projects.

Introduction

Rural women in Bangladesh contribute significantly to the agricultural economy and household food security. They

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constitute 48% of the total population of Bangladesh, where 90% of them live in rural areas. Unlike in other south-east and South Asian countries where poor women provide most of the labour in rice production operations, in Bangladesh, women work within the confines of their homesteads due to social, religious, and cultural restrictions. They provide most of the labour in economic activities within the homesteads such as dehusking paddy, parboiling rice, drying, selecting and storing seeds, rearing goats and poultry, milking dairy animals, making cow dung cakes for household fuel, and growing vegetables. However, in tribal and very poor farming communities, female family members have to work in their fields as well as on other farms as hired labourers, due to economic necessity (Rothschild, et al, 1989, Westgaard, 1993, Abdullah, 1978). Thus, poverty pushes women to work in the fields. Women from rice farming households are also the repositories of indigenous knowledge and participants in decisions related to seed management and storage.

In Bangladesh where wheat is grown after rice, women participate in wheat seed production and preservation (Meisner et al, 2000). They are involved in supervising the fields, drying, seed selection and preservation, weeding, harvesting and threshing, Their participation varies depending upon the family's socio-economic status and the agricultural technologies adopted by a household and locality. Other factors influencing women's role in wheat production include the regional acceptance of women assuming less traditional roles (such as crop field work) and a woman's status within a household (wife, mother-in-law, daughter). Their research also revealed that generally women do participate in decisions related to wheat production.

For a long time, NGOs such as BRAC, Proshika, CARE, etc. have undertaken successful micro-credit and development programmes targeting the ultra-poor and landless women to alleviate their poverty. However, rice research and extension programmes have neglected to pay explicit attention to the roles, constraints and technology needs of poor women engaged in rice production and post-harvest activities. This is due to the perception that these activities which are done within the homestead are extension of household tasks and are not part of agriculture. This perception automatically excludes women as participants in on-farm research, training and extension programmes. This neglect has consequences that are often detrimental not only to the household food (rice) security and social status of the women themselves and their families but also to the success of poverty alleviation programmes and projects.

The purpose and philosophy of the PETRRA project

One of the major strategies in eliminating rural poverty and sustaining food security of poor rice eating population is by increasing the productivity and income through rice research. Thus the PETRRA project was approved by the Government of Bangladesh (GOB) in March 1999. The project will run for five years with funding from the UK Department for International Development (DFID). The project is implemented by the International Rice Research Institute (IRRI) through a project management unit (PMU) at its country office and in partnership with the Bangladesh Rice Research Institute (BRRI). The project provides financial support for research through partnerships between IRRI, BRRI, Universities, NGOs and other international research institutes.

The purpose of the PETRRA project is to enhance the productive potential of

rice-based farming systems in Bangladesh. The goal of the project is to substantially increase domestic rice production and incomes by 2008 such that it contributes towards a 50% reduction in rural and urban poverty by 2015. To ensure that the impact of new rice research is felt widely and speedily as possible the PETRRA project will facilitate the development of a research system that:

- targets resource-poor farming households;
- fosters gender equality and environmental protection;
- prioritises research problems and develops technologies with strong participation of farmers;
- clearly defines research themes that link technology and uptake; and
- collaborates with other partner organisations.

Research partners

IRRI and BRRI are major partners in PETRRA's projects as they are the major institutions which generate rice technologies. IRRI's mission is 'to reduce poverty and hunger, improve the health of rice farmers and consumers, and ensure environmental sustainability through collaborative research, partnerships, and the strengthening of national agricultural research and extension systems'. IRRI serves as a facilitator, a mentor of science and provides a global knowledge base. Research planning and management at BRRI are directed on the basis of ecosystem and problem oriented concepts. The programme areas include variety development (Plant Breeding, Genetic Resources and Seed, Biotechnology, grain quality and nutrition), socio-economics and policy, crop-soil water management, pest management (Entomology and Plant Pathology), Rice Farming Systems, Farm Machinery and Post-Harvest and Adaptive Research and Training Divisions.

Although the 'farmers' are the ultimate beneficiaries of rice research of BRRI, the farmers being referred to are the male farmers. The interaction between scientists and farmers is weak and most of the research activities are conducted at the research station. Experiments conducted in farmers' fields are carried on through adaptive research and farming systems research (FSR) while the Training Unit at BRRI handles farmers' training. Despite the past efforts of IRRI's women in rice farming systems (WIRFS) network in addressing the technology needs of rural women through Farming Systems Research in the mid 1980s, these efforts have not been sustained due to the lack of a gender policy in BRRI and fast turnover of staff members. Moreover there was a lack of social scientists (non-economists) in BRRI with skills in farmer participatory research and interacting with farmers, especially with women. NGOs have been far more forthcoming in mainstreaming gender. NGOs in Bangladesh such as CARE, Proshika, Grameen Krishi Foundation (GKF), BRAC, RDRS, Agri Business Corporation (ABC), Shushilan, etc., work directly with grassroot level organisations and farmers.

Thus, a strong partnership among IRRI, BRRI, NGOs, agricultural universities and private organisations is necessary to bring gender to the fore and accelerate the uptake of rice technologies, increase rice productivity and eliminate poverty of small and marginal rice farming households.

Petrra's gender strategy

The participation of farmers, especially women, in technology development and

uptake is vital for having a positive impact on poor people. Incorporating concerns for both male and female farmers into the research agenda of IRRI, BRRI, NGOs and other universities under the overall umbrella of the PETRRA project will not only help improve women's welfare and gender equity but will also enhance the relevance and content of their research programmes.

The goal of this gender strategy is to give women equal importance with men in setting research priorities, participating in technology development, and evaluating impact on rice production and income.

The five areas wherein gender will be incorporated are:

- technology development;
- enhancing capacity for demand-led research;
- uptake pathways;
- policy; and
- impact.

Technology development through farmer participatory research

Women's constraints in performing their traditional roles in rice post-harvest and processing activities, seed selection, and storage will be addressed by introducing technology options that can increase their labour efficiency, reduce the time spent on tasks of drudgery and provide income earning opportunities. Examples of these technology options are: improved seed management (seed health) techniques, improved methods of storing rice seeds, seed dryer and cleaner, rice husk stove, portable micro rice mill, portable micro rice flour mill, pedal thresher and other labour saving tools and equipment. These technologies will be tested, and evaluated by men and women or by women's groups through farmer participatory research.

Enhancing capacity for demand-led research

To enhance the knowledge and skills of the target groups of PETRRA funded projects, both men and women from resource-poor households will participate in hands-on training on seed related technologies such as seed health, storage and in operating rice processing equipment. Empowering rural women is an important element in the participatory research process. Understanding both male and female farmers' practices, perceptions, knowledge and skills will provide bases for identifying methods and approaches for capacity building. Learning by doing and farmer to farmer training are some of the approaches that will be used for effective capacity enhancement of farmers. Collaborators in the PETRRA projects have already undergone orientation and training on gender analysis. PETRRA will continue to provide staff training on gender analysis and its application in the projects. Gender Specialists from IRRI, BRRI and NGOs will be consulted to provide this training and promote gender awareness and gender sensitivity in the PETRRA funded sub-projects. PETRRA will also use the capacity of one female staff member to build in-house capacity for implementing this gender strategy.

Uptake pathways

To facilitate technology uptake, PETRRA will identify uptake pathways that link the design, development and spread of technology with its farmer target group, including women from resource-poor households. PETRRA will collaborate with local organisations and NGOs e.g., Proshika, CARE, BRAC, Shushilan which are already working with women's groups to speed up uptake of technologies that will directly benefit poor rural women.

Policy and impact studies

Policy and impact studies related to women and children's welfare will be conducted under the PETRRA project. Benchmark information will include gender disaggregated variables for impact assessment Changes in the intrahousehold distribution of resources, labour efficiency, productivity, income, access to education, work load, health, nutrition, empowerment, knowledge, skills, gender relations, etc. will be evaluated.

While research focuses on stages of rice production in which women are not directly involved, PETRRA should be sensitive to the potential indirect effect on women's productive roles. For example, it should be cautious about introducing new technologies that make excessive demands on women's time and labour. PETRRA recognises that increases in income from rice may not be reflected in improved diet and child schooling unless women have access to how that income is spent and also some control over it.

Action plan for mainstreaming gender concerns

The PETRRA project will translate the gender strategy into practice through an action plan that will prioritise these different activities and monitor the impact of implementing the strategy.

Management level

- Make the gender policy of PETRRA visible in many of the documents that PETRRA produces or sponsors;
- Appoint/contract a part-time Gender Specialist for two weeks every year to support the strategy;
- Identify gender experts (men and women) to review project concept notes (CNs) and project proposals for their gender implications before they are approved (see examples of gender audit in Table A3 of the Appendix);
- Amend the TEC guidelines and CN/research proposal (RP) checklists to include gender considerations;
- Mention 'women' as intended beneficiaries of the projects which deal with on-farm research/interventions that will directly affect women's roles and resources;
- Establish a gender sensitive monitoring and evaluation (M&E) system through the sub-project (SP) progress reporting;
- Include gender impact indicators in the guidelines for preparing CNs for submission to the PETRRA project. Ask whether and how the inclusion of women in the participatory research, training or extension will directly benefit from the project or will contribute to poverty elimination;
- Consider women's constraints in the CNs and also commission work on specific gender issues in each CN call;
- Support SPs that specifically target women as direct beneficiaries of research on seed health, storage, post-harvest machinery and hybrid rice seed production;
- Conduct policy studies that are related to women and children's welfare;
- Include topics on gender concerns (decision making, assessment of roles of women and men, access to and control of resources and information) in training programmes and work plan meetings organised by PETRRA;
- Organise/facilitate staff training with NGOs on awareness on gender issues in rice farming and how these issues can be addressed in research, adaptive research, training and extension plans and programmes;
- Stimulate the formulation of gender policy statement in BRRI;

- Support the task force and focal person on gender issues in BRRI and other partner institutions;
- Support institutional development in BRRI (and partners) on the issues raised by BRRI female scientists and develop a system on how, when and by whom each issue will be followed up; and
- Include female members in each research team of the SPs.

Sub-project level

- Include gender activity profile (Who does what specific operations in crop, livestock) and constraints analysis as part of stakeholder analysis;
- Include gender variables in participatory rural appraisal (PRA) tools when describing the site, farmers' practice and initial problem diagnosis and prioritisation;
- Include gender-disaggregated information in the benchmark surveys for monitoring impact;
- Undertake participatory field level research with men and female farmers (female heads of households or active female farmers) on crop variety improvement, post-harvest, farm machinery, farming systems research;
- Ensure that women are well represented among farmers included in project activities such as field days, workshops, training, and extension and in demonstration plots;
- Use a mix of quantitative and qualitative indicators of status of gender relations; and
- Specify the number of male and female farmer participants in on-farm research, training and extension activities.

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Appendices

A1. Guidelines for incorporating gender concerns at sub-project level

Initial site description and problem diagnosis, constraint analysis

- Collect gender-disaggregated benchmark information such as:
  - composition of the population by sex and age, education level of males and females;
  - proportion of farming and landless families, farming households by farm size;
  - proportion of female-headed households (de facto, de jure); and
  - number of economically active population by sex and age, occupation of men and women;
- Collect information on the gender division of labour (Who often does what in the household, crop, livestock, on-farm, off-farm and non-farm activities). List the specific operations per enterprise;
- Collect information on time spent by male and female family labour in each enterprise and sequence of activities. This will provide information where interventions can be made;
- Collect indicators to assess impact after the project as well as intrahousehold allocation of resources (changes in productivity, income, education, work load, education, health, nutrition, empowerment, knowledge, skills, etc.) and gender relations;
- Identify men and women's access to and control of resources in rice production and gender differences in constraints to productivity:
  - Conduct a focussed study or baseline survey to determine access to knowledge, farmers' perceptions, beliefs and attitudes on seed, pest (weeds, insects) and disease management, and rice storage practices by gender, and socio-economic status. This baseline survey, among other issues is to establish the extent of the problem in rice associated with seed health, pest and disease;
  - Conduct focussed study to determine gender differences in access to sources of information, training, extension and other resources such as HYV seeds, water, machinery, etc. This information is needed to identify the constraints and needs of both women and men in increasing rice productivity; and
  - Conduct a focussed study to identify whether there are gender differences in control of resources. Ask, who makes major decisions in crop production and post-harvest operations? Who is responsible in ensuring that the work or activity is completed? Who allocates the money within the household? Who makes decisions in specific post-harvest and seed management operations?

Identification of technology options, opportunities to solve the constraints

Match gender roles, constraints, opportunities to solve these constraints and technology options. Consult with BRRI scientists, other agricultural research universities, NGOs, private institutions, whether there are potential technologies (on the shelf or already developed) which can be fine-tuned, refined with men and female farmers, individually or as a group. Examples of these are: improved seed management practices, post-harvest machinery, integrated pest management, etc.

Conduct farmer participatory on-farm research

- Identify the resource-poor farming households (size of land, wealth, and income) who will be cooperators of on-farm research;
- Include male and female farmer collaborators in planning meetings to clarify the objectives, hypothesis, and design of on-farm research. and other requirements of the research e.g., not to mix varieties/seeds after harvesting. Define the roles of the scientists, farmers, and development workers in conducting on-farm research;
- Include male and female farmers as cooperators in on-farm research e.g., in seed demonstration plots, participatory varietal selection, improving seed quality SPs etc.;
- Include men and women in training activities related to seed health, seed storage and other issues such as integrated weed management, integrated pest management, integrated nutrient management;
- Elicit male and female farmers' criteria and preferences for rice varieties; and

  Train women on how to operate 'women-friendly' tools, equipment, machinery e.g., pedal thresher, rice flour mill, rice huller, rice husk stove and obtain their feedback in fine tuning these technologies.

Monitoring

- Collect data for monitoring agronomic or technical performance, economic viability (costs and returns) and social acceptability;
- Obtain feedback from male and female farmer collaborators through frequent dialogues; and
- Conduct village level workshops and include women in cross-site visits for feedback on the research results to farmer collaborators.

Technology uptake

- Include women, if possible and not only men in field days, field demonstrations, cross-site visits; and
- Conduct training in the village and adjust the training schedule to allow women to fulfill their reproductive roles.

Establishing support mechanisms to sustain project activities

- For NGOs to mobilise women and to build rapport with individual and women's groups; and
- For NGOs to facilitate credit schemes to support and sustain the adoption of technologies.

Evaluation of long-term impact

- Evaluate the technology on the basis of technical feasibility, economic viability, social (gender) acceptability and environmental impact;
- Evaluate the impact of the project at the national, village, household and intrahousehold levels;
- Conduct pre and post knowledge gain test for specific topics, separately for men and women; and
- Encourage farmers (men and women) to develop their own indicators of poverty and also how to reduce it.

A2. Questions and documentation

Questions for gender impact assessment of PETRRA funded projects

The gender differential impact of the project can be assessed through quantitative and qualitative indicators obtained through formal and informal methods of data collection. Case studies will be developed to highlight successful cases where women are direct targets of PETRRA's projects. Some of the questions in gender impact assessment are:

- What percent of men and women are involved in PETRRA's projects and SP activities? (on-farm research, demonstrations, field visits, etc.);
- Did the project reduce women's time spent in drudgery, increase their labour efficiency and reduce their household expenditures?
- Did the project displace labour or diversify labour use?
- Did men take over women's traditional jobs with the introduction of technology?
- Did the project increase women's access to resources (e.g., seeds, quality seeds, credit, inputs, etc.);
- Did the farmer participatory training on seed health or machinery enhance women's knowledge and skills?
- Did the project bring about changes (positive or negative) on gender relations?
- Did the project increase women's self-esteem and self-worth?
- Did the project empower women or the women's group?
- Did the increase in rice income lead to better intra-household distribution of resources (e.g., better education and nutrition for girls)? and
- Did the increase in rice income improve the nutrition and health status of mothers and children? Is the diet more diversified and of better quality?

Table A1. Percentage labour contribution of women relative to men in various rice production and post production activities (based on PRA)

	Bhanga, Faridpur	Habiganj	Chimna, Rajshahi	Maijdi, Noakhali	Kushtia (central-west region)	Rangpur	Comilla region
Incubating seeds	100	100	100	75	100		
Preparing seedbed				25			
Uprooting seedlings	30			25		10	
Transplanting	30		50	25		10	
Surface irrigation				12			
Application of fertiliser	20			25			
Weeding	10		50	25		10	
Harvesting			50	50			
Threshing	100		50	50			50
Drying paddy	100	100	100	75	100	100	90
Winnowing	100	75	100	100	100	100	100
Storing paddy	90	100	100	100		50	
Parboiling rice	100	100	100	75	100	100	
Drying straw	70					80	
Milling of paddy				6	100		
Seed selection							100

Source: Gender impact assessment training report, PETRRA, January 2001

Documentation of the process, impact of the project

- Write case studies on the process of technology process;
- Write case studies on success stories of farmers (male and female) due to the project; and
- Encourage farmer collaborators to document their participation in the project to enable them to 'own' and get credit for their own achievements.

A3. PETRRA's on-going efforts to address gender concerns

Based on the participatory gender review and support consultancy for DFID's Rural Livelihood Projects and first output to purpose review (OPR), several recommendations were made by the gender review team. These were to:

- conduct gender awareness and sensitivity training for all staff;
- consider developing a gender strategy instead of a 'gender position paper';
- link with the CARE Agriculture and Natural Resources (ANR) sector gender unit to gain understanding of developing a gender strategy;
- recruit a Gender/Social Development Specialist to support the current gender activities planned for the project;
- conduct gender analysis to understand the different roles played by women and men and their needs and circumstances;
- fully integrate gender issues in the benchmark survey; and
- establish a gender sensitive M&E system.

In July 2000, PETRRA organised a meeting with collaborators involved in seed uptake and a Gender Specialist from IRRI was invited to participate. Based on this meeting, several efforts were initiated by PETRRA. A stakeholder analysis was conducted and team members of the PETRRA project participated in gender impact assessment training (in 2001). Gender analysis was conducted which confirmed the gender-specific tasks and responsibilities in rice production in specific project sites. As shown on Tables 1 and 2, seed selection, seed storage, and post-harvest activities are women's domains (PETRRA 2001 Report).

The tradition is that Muslim women do not work outside their homesteads but Hindu and tribal women are directly involved in fieldwork, especially transplanting, weeding, etc.

Although their working efficiency is the same, actual wages for male and female and duration of working periods are different. Female labourers get Tk. 50 for 6 hours (8 to 12 pm and 4 pm to 6 pm) but male labourers get Tk. 70 for 9 hours (6 am to 12 pm and 3 pm to 6 pm).

Through PRA, efforts were made to interview men and women's groups separately. Male and female gave identical rankings to the problems of seed quality and high input costs. However, two important differences emerged:

- Women did not recognise the same problems as men. Water, depth, quality of inputs or soils did not figure on their list of problems; and
- Women's lack of knowledge of MV cultivation, shortage of farm power and labour were the major problems they face while performing their responsibilities.

Results of the household surveys under the PETRRA SP on rice seed health improvement show that women do agricultural work (Diaz, et al 2000). For all the sites, about 78% of the households claimed that women participate in the soaking of seeds, 95% in drying, 37% in threshing and 52% in seed preservation. Very few women participate in crop field activities like land preparation, seedbed preparation, pulling of seedlings, transplanting, weeding and harvesting. Livestock raising is a major work for women in Bangladesh. In general, women's participation in agricultural work in Bangladesh is high although this varies across locations. In the Chuadanga, Barisal and Habiganj villages, women contribute substantially in homestead-

based crop activities like threshing, drying, seed selection and seed preservation. Gazipur, Bogra and Rajshahi indicated an average involvement in post-harvest operations while Rangpur had marginal involvement of women in these activities. The low participation of women in Rangpur in post-harvest work and seed management could be due to their high involvement in animal raising. This report also reveals that in unfavourable areas, where traditional varieties are grown and modern varieties are not widely adopted, the income of farmers is low, compelling women to work more. Poverty pushes women to participate more in agricultural work. Women's involvement in agriculture can be a good indicator of the level of poverty.

A participatory assessment of the seed health project in four villages in the districts of Gazipur, Habiganj, Bogra and Rangpur was conducted in July 2000 (McAllister, 2000). This assessment was conducted to understand the male and female farmers' perception and knowledge of seed quality issues (seed health, access to good quality seed, loss of seed, etc.). Women interviewed, expressed their desire to participate in training programmes on improved methods of cleaning seeds. Their main concerns in maintaining the quality of rice seeds were problems during storage (seeds tend to get mixed up, insect and rat infestation during storage, floods etc.), lack of inputs at the time when required, lack of access to good quality seeds/varieties (often get mixed varieties from dealers, sources of quality seeds are far from the villages), and high cost of quality seeds. This assessment recommends the following:

- the projects related to seed uptake, seed health, and post-harvest technologies should also involve female farmers;
- both husbands and wives should be given training on seed storage and preservation; and
- training activities should be designed as such that female extension workers are also present and the time should be adjusted to enable women to finish their household and child care responsibilities.

Table A2. Male and female labour participation in rice production

Operations	All seasons	
	Female	Male
Dry seeds	100	
Soak seeds	90	10
Sun dry	50	50
2nd soaking	100	
Put in gunny bags	10	90
Broadcast		100
Drive away pests	100	
Uproot seedlings		100
Prepare land		100
Transplant		100
Weed		100
Apply fertiliser		100
Spray insecticides		100
Harvest		100
Thresh		100
Parboil	100	
Dry sun	100	
Mill	50	50
Select seeds	100	

Source: Gender impact assessment training report, PETRRA, January 2001

A4. Gender audit of PETRRA's SPs

In developing the gender strategy plan, the Gender Specialist from IRRI Headquarters reviewed whether the needs of both men and women were considered in relevant SPs, where gender mattered. A gender audit of ongoing and new projects is necessary to identify where PETRRA can have major gains and innovations in terms of gender equity, both in the field and in key national institutions promoting a crucial sub-component of rural livelihoods. Table A3 shows the gender audit of PETRRA SPs.

During the consultancy meetings with BRRI female scientists and with both male and female scientists held in January 23 and 25, 2001, several research opportunities to enhance women's roles were identified (Table A4).

Table A3. Gender audit of PETRRA SPs as recorded in January 2001

Number	Title	Activities	Gender audit
SP 01 00 (Adaptive Research Division, BRRI) Pirojpur, Tangail, Narshingdi and Dinajpur districts	Accelerated dissemination of rice varieties (BRRI dhan28 and 29) through on-farm demonstration, seed promotion and training	• Twelve hectares belonging to 80 farmers were brought under demonstration and seed promotion activities; • Training of farmers and NGO-DAE field staff on rice production held; • 3 large field days held; and • A total of 68 tonnes of seeds produced.	• Women are not mentioned as cooperators and direct beneficiaries. It is not explicitly mentioned whether they are involved as collaborators in demo plots, or included in field days, training activities, etc.; and • However, since seed selection, seed storage and post-harvest activities are women's domain, they should also be involved in the project activities. They can be tapped as seed producers, given the adequate hands-on skills through training and extension activities.
SP 02 00 (Genetic Resources and Seed Division, BRRI)	Breeder seed production and its distribution for ultimate use of quality seed at farm level through sustainable seed networks	• Benchmark survey conducted; • Farmers for demo plots trained; and • Technology on seed production and hybrid rice cultivation.	• Women are not mentioned as direct beneficiaries.
SP 03 00 (BRAC) Nandina upazila, Jamalpur district	Pilot variety uptake scheme for coming *aman* and *boro* season Technology uptake: pilot scheme	To conduct a demonstration on BRRI dhan32, BRRI dhan33 and BRRI dhan39 in 3 villages under Nandina upazila.	• The beneficiaries of the scheme will be 600 resource-poor (marginal and small) farmers who are directly involved in these activities but women are not mentioned; • Women are not included as cooperators in on-farm research; and • There is a plan to include women as participants in the training on post-harvest technologies.
SP 04 00 (GKF) Shibganj and Kahalu upazila, Bogra district		• Resource-poor farmers training on improved rice seed production; • Farmers included for demo plots; and • Field days, workshops conducted.	• Women are not explicitly mentioned as direct beneficiaries.
SP 0500 (AAS) Kishoreganj district	Pilot Variety Uptake Scheme for 2000 T. *aman* and 2000-1 *boro* season	• Benchmark conducted; • 3 scheme sites established in 3 upazilas; and • Conduct farmers' training on 'farmer to farmer seed exchange programme'.	• Farmers' training on 'farmer-to-farmer seed exchange programme' for 3 schemes do not include female farmers; and • Women are not included as farm collaborators.
SP 06 00 (Proshika) Sadar upazila, Barisal district	Introduction of new varieties of rice to improve the livelihoods of resource-poor farmers:	• Benchmark survey conducted in 3 villages; • A total of 40 small and marginal resource-poor farmers selected for demo plots;	• Of the 40 farmers, 20 farmers will be female; and • Women are mentioned as intended beneficiaries of this project.

(continued in the next page...)

Table A3. Gender audit of PETRRA SPs (cont.)

Number	Title	Activities	Gender audit
	BRRI dhan28, BRRI dhan29 BRRI dhan31, BRRI dhan32	• Training of 40 farmers held in the training centre of Proshika; • Fields days (9) held; and • Workshops conducted.	
SP 07 00 (RDRS)	Improving rice production through technology transfer and strengthening local storage: • Increase rice yield by at least 25%; • Accessibility to quality seeds increased; and • Storage of HYV seeds improved in collaboration with Allied Agro Industries and BRRI by equipping RDRS federation grain stores of grain cocoon in to a revolving fund for future replication	• A total of 50 small and marginal groups trained to produce HYV seeds; • Skills training on improved seed production and rice production technologies given to a total of 500 farmers and 12 RDRS and DAE staff; • Demonstration given on improved seed production and rice-based cropping pattern in 60 plots in 3 union federations in each of *aman* and *boro*; and • Field days and workshops conducted.	• 25% women beneficiaries will be involved in this programme. Both men and women will be included in the training programme with emphasis on the production – oriented interventions while training on post-harvest operations will include women only. The proposed project will prioritise women's involvement in the post-harvest activities i.e., processing, drying, grading, storing, seed preservation, etc. As these activities are household- based, it will be easier for women to manage the seeds.
SP 08 00 (Agri Business Corporation) Birganj upazila, Dinajpur district	• Target for production of quality seed to achieve 25% increase in rice production by 2008; and • Seeds of BRRI dhan28 and dhan29 (*boro*) and BRRI dhan30 and BRRI dhan31 (*aman*) and hybrid rice will be increased.	• Three villages selected for demo plots; • 60 interested marginal farmers familiar with HYV cultivation will be trained to produce and preserve quality seeds; • One orientation programme for selected farmers organised for 10 days; • Field days conducted at different stages of rice growth and maturity; • One workshop held for farmer-sharing experience; • 50,000 kg (*aman*-20,000 kg + *boro*-30,000 kg seeds will be produced); and • 1,667 acres of land for next *aman* and *boro* will be cultivated.	• Gender division of labour is included in stakeholder analysis; • Female farmers are not included as cooperators in demo plots, training, field days; and • Women are not explicitly mentioned as direct beneficiaries.
SP 09 00 (Shushilan) Satkhira district	Technology uptake: pilot scheme • Rice production of resource-poor farm household increased by 50%; and • Income of resource-poor farm households increased by 30%.	• Benchmark surveys conducted; • One workshop held to assess the problems and prospect of HYV seed production and distribution (140 participants); • 12 cultural programmes held to develop mass awareness on various issues in development; • 24 farmers (8 per village) selected for demonstration plots set up in 3 villages; • Training on HYV technology, cultural practices, control of disease and pest given to 24 farmers;	• Gender division of labour is included in stakeholder analysis. Suggestions for gender equity: • Allot at least 50% demonstration plots to women members of poor and marginal households; • Ensure that of the total farmers trained and invited in field days, at least 50% are women; and • Women's roles and constraints can be included in the drama or stage plays.

(continued in the next page...)

Table A3. Gender audit of PETRRA SPs (cont.)

Number	Title	Activities	Gender audit
		• 300 farmers invited in field days; • A village cooperative formed to provide farmers access to quality seed; and • Dependence of chemical fertilisers and pesticides minimised in the villages.	
SP 10 00 (BRRI) Kushtia and Meherpur districts	Sustainable nutrient management in intensive cropping systems	• 20 farmers will be selected.; • Inventory of crops and cropping patterns, production practices and productivity; and • Establishment of nutrient omission plots.	• Implications on female labour should be examined.
SP 11 00 (IRRI)	Flood prone village study revisit	• 16 villages belonging to flood prone ecosystem included in the study· 30 sample households from each village were interviewed based on wealth ranking.	• Gender variables are included in the household survey on livelihood systems of rural households. Labour use in crop and livestock activities, decision making in crop production activities, income from off-farm and non-farm sources are disaggregated by gender. Household member level data on health status, morbidity, access to health care and membership of organisations are collected and can be used for analysis in intra-household equity in the distribution of resources.
SP 12 00 (NRI, BAU, BRRI)	Access to quality agri-inputs by resource-poor farm households		Did not see the CN
SP 13 00 (IRRI, BRRI, BAU)	Development of high-yielding rice varieties (HYV) of the coastal wetland of Bangladesh		Did not see the CN • Should include assessment of male and female's criteria of rice varieties and use participatory approach in varietal selection.
SP 14 00 (NRI, BRRI)	Rice and livelihoods of the increasingly diversifying economy of south-west Bangladesh		Did not see the CN • Should conduct gender analysis and assess impact on male and female family labour.
SP 15 00 (IRRI, BRRI)	Development and use of hybrid rice technology in Bangladesh		Did not see the CN • Women can be tapped as producers of hybrid seeds if given adequate training and support.
SP 16 00 (BRRI)	Arsenic in the flood chain: assessment of the water-soil-crop-systems in target areas of Bangladesh		Did not see the CN • Women will indirectly benefit from technologies that will reduce arsenic in water.
SP 0099 BRRI-IRRI-NGOs	Seed health improvement project		• This should highlight the positive impact (increase in yield due to involvement of women) of the project by including women as collaborators; • Female farmers are explicitly mentioned as participants in the project activities; • Special study on gender roles and constraints in seed selection and seed management is being conducted; • Female farmers are included in on-farm research, training activities; and • Women are included in impact assessment of the project.

Source: PETRRA project concept notes (CNs), 2000

Table A4. Constraints of female farmers, research and adaptive research, training and extension opportunities identified by BRRI scientists

Women's constraints	Adaptive research which can enhance women's role	Programmes which can be involved
Lack of access to HYV seeds which meet their criteria and preference and special needs (nutrition, other crop products such as puffed rice, flat rice, polao rice etc.).	• Elicit male and female farmers' preferences and criteria for rice varietal selection in specific rainfed rice ecosystems and include these criteria in plant breeding objectives; and • Introduce vitamin and iron enriched rice genotypes with women as farmer cooperators.	Rice varietal improvement
Lack of knowledge of women in tribal areas on how to identify insect pests and diseases; how to differentiate harmful and beneficial insects; how to control them using the concepts of INM and IPM; use of healthy and non-healthy seeds to increase yields.	• Conduct gender analysis in tribal areas particularly gender differences on the practices, knowledge and beliefs in pest, disease, seed, cultural management and identify options to improve farming practices in Laksham, Comilla, Haluaghat of Mymensingh and Chittagong Hill Tracts; • Include women as farmer cooperators in farmer participatory research on IPM; • Conduct on-farm participatory research on location specific pests (hispa, gall midge, blast, ufra); • Determine if IPM technologies are socially acceptable or not; and • Include base level workers for technology development.	Plant Pathology Division and Entomology Division
Poor quality seeds and lack of knowledge on improved seed management.	• Women should be included in on-farm participatory experiments on seed health and training for improving seed quality (disease free) for storing and production of more rice.	Plant Pathology Division and Training Division
Poor nutrition.	• To include vitamin enriched rice varieties.	Plant Breeding Division
Declining source of household fuel; inefficient *chula* (stoves).	• Conduct on-farm research to increase fuel efficiency of traditional *chula* (stoves).	Farm Machinery and Post-Harvest Technology Division
Lack of supplementary irrigation.	• Introduction of small-scale irrigation.	Farm Machinery and Post-Harvest Technology Division
Low returns from income generating activities within the homesteads such as vegetable gardening, poultry, goat rearing, ornamental crops.	• Testing profitable and income-generating activities using low inputs.	Rice Farming Systems Division and Adaptive Research Division
Lack of technical know-how.	• Include female farmers in rice-related hands-on training such as seed selection, preservation and seed processing; use of indigenous irrigation implements; use of equipment and women-friendly machinery; and • Female farmers should be included in demonstration plots, field days, training, workshops organised by the project. At least 25% of the total number of participants in training programmes should be women from resource-poor rice farming households.	Adaptive Research Division
• Drudgery in women's unpaid tasks in processing rice; • Difficulty in threshing during the rainy season; and • Women manually thresh inside their homestead.	Demonstration, testing, and adaptation of machinery such as micro rice mill for women, pedal thresher, etc. with women/women's groups.	Farm Machinery and Post-Harvest Technology Division and private consultants e.g., rural technology NGOs
Declining livestock population and declining source of household fuel.	Maximise the use of compost using FYM such as biogas, organic fertiliser.	Farm Machinery and Post-Harvest Technology Division and Rice Farming Systems Division
Disappearance of traditional varieties.	Enhance women's role in germplasm conservation especially local and wild varieties.	Plant Breeding Division
Lack of access to newly released improved rice varieties.	• Provide women (female headed households, resource-poor from small and marginal rice farming households) access to improve rice varieties through adaptive research; • Tap women/women's groups as key seed rice producers including hybrid seeds; and • Train female farmers on production of quality seeds for income generation.	Adaptive Research Division

Source: Meetings with BRRI scientists, January 2001

A5. Problems of BRRI female scientists

Female scientists in BRRI are generally happy with their work. However, they expressed problems which restrict them from working with female farmers and also affect the ability to combine their family responsibilities and professional growth at BRRI (Table A5). It is important for PETRRA to work with the BRRI gender task force to follow up on these recommendations and decide how each issue will be followed up, by whom and when. During this meeting, the BRRI female scientists also expressed their strong desire to have an independent research programme to address gender issues in agriculture and enhance the roles of female farmers, using their expertise.

Table A5. Problems of BRRI female scientists

Problems in the working conditions of female scientists	Suggestions to solve these constraints
Some scientists are given assignments for which they did not receive their basic degree.	Match work assignments based on formal education.
Absence of mid level scientists resulted to lack or inadequate guidance from senior scientists.	Build capacities of qualified junior scientists to enable them to be promoted to higher positions.
Underestimation of women's capacity may be attributed to their lack of skills to express themselves.	• Provide opportunities to participate in training programmes wherein they can improve their skills in oral and written communication. IRRI offers such courses exclusively for IRRI staff only.; and
	• IRRI plans to organise a women's leadership training for NARS collaborators. This is one opportunity to enhance the capabilities of BRRI female staff.
Lack of sensitivity of men to gender issues in the working place and at the farm level.	Include men in all activities and projects related to gender and agricultural development.
Female scientists are rarely involved in on-farm research thus they do not have direct contact with female farmers.	Ensure that participatory approaches are used in on-farm testing and evaluation of technologies which directly influence women's roles.
Difficulty of breast feeding their babies during office hours and lack of day care facilities.	Provide women flexible hours and day care facilities within the research compound.
Difficulty in communicating with their children left at home to check on their activities.	Provide one public telephone to enable mothers to call their homes in case of emergency.
Lack of ladies toilets and prayer rooms.	Provide clean ladies toilets and prayer rooms. There are rooms which are not being used and can be converted into prayers rooms.

Source: Synthesis of the meeting with BRRI female scientists convened by Dr. Nilufer Hye Karim, Gender Focal Person at BRRI, January 22, 2001

Suggested citation:

Paris, T. R. 2007. Gender strategy. In: Magor, N. P., Salahuddin, A., Haque, M., Biswas, T. K. and Bannerman, M., editors. PETRRA – an experiment in pro-poor agricultural research. Strategy brief no. 2.5. Dhaka (Bangladesh): Poverty Elimination Through Rice Research Assistance Project, International Rice Research Institute. 18 p.

Communication strategy

Peter Fredenburg

Putting together a project as large and complex as Poverty Elimination Through Rice Research Assistance (PETRRA) is rather like constructing a high-rise building, as PETRRA project manager Noel Magor explains. During the many months of laying the foundations, little progress is visible from beyond the fence. Then, with surprising speed, the structure rises for all to see. Two years plus into the PETRRA project, it is time to develop a communication strategy to manage how the new structure fits into the research and extension landscape of Bangladesh.

The following suggested framework for a communication strategy emerged in meetings between February 10 and 14, 2002 that included Peter Fredenburg, writer/editor of IRRI Visitors and Information Services, the PETRRA project management unit (PMU) and the various agricultural information organisations in Bangladesh. The framework covers information outlets, target audiences and human resource needs for implementaion.

Information outlets

The core of the PETRRA communication strategy is a website, which will serve as both the source of material for some other outlets and an additional avenue of dissemination and repository for material initially written for other outlets. The plan is to minimise the need to generate new material by recycling as much of it as proves practical.

From the website homepage we envision four main buttons, or avenues, into the site, which are shown below (with part of the next level down):

1. PETRRA strategy and procedures (includes guidelines);
2. Focal areas;
3. Research themes:
   a. Policy;
   b. Impact;
   c. Productivity;
   d. Uptake; and
4. News.

The existing project strategy document can be cannibalised to provide material for almost all of 1 and for the introductions to 2 and 3, as well as for the introductions to the several (provisional) research themes under 3. Under focal areas, the individual geographical areas can be introduced using material from existing stakeholder survey reports and intervention recommendations. Access to the web pages covering the 30-odd individual sub-projects (SPs) will be by at least two routes, through focal areas (all the SPs within a given focal area) and through research themes (all the SPs within a given research theme). The intention of this dual architecture is to combine ease of access to donors and other international parties – who are likely to find categorisation of SPs by research themes the easy way to navigate – with emphasis on the non-technical, bottom-up, participatory philosophy of PETRRA, which is expressed by focal area organisation. By the end of the PETRRA

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project, local non-governmental organisations (NGOs) may be in a position to take over and expand their discrete focal area portion of the site.

Summaries of quarterly reports of the SPs will provide new material for posting on the website, initially under the news section and later shifted to the appropriate SP pages. Researchers should therefore be encouraged to write their report summaries in popular style ('imagine you are writing a letter to your mother about what you have been working on for the last few months…').

The final website that is used to archive PETRRA documents is shown below.

Newsletters will be published semiannually, separately in English and Bangla, to a large extent reusing material (quarterly report summaries, press and photo releases) that are already on the website (and must be translated for the Bangla newsletter). As the English and Bangla newsletters have different target audiences, they would not use exactly the same material, but there will likely be considerable overlap. A pdf version of the most recent newsletter in each language could be directly accessed from the website homepage.

Krishikotha (Farm Talk) is a monthly magazine published by the Agriculture Information Service (AIS) of the Ministry of Agriculture (MOA), in press runs of 30,000-35,000 copies, distributed to Block Supervisors (BSs) nationwide (there are 3 Blocks per union, which is the lowest level of local government. Each block includes about 1,000 farmers). In a meeting with 3 senior editors of *Krishikotha*, they enthusiastically welcomed the suggestion that PETRRA supplies topics for joint development and/or prepared texts for publication in *Krishikotha*, including several related stories for clustering in issues devoted to special topics. Story lineups are set at least a couple of months in advance. This promises to be a cost-effective way to get printed materials within reach of literate farmers. Perhaps the next step should be to send proposed topics to the AIS for a series of 5 to 10 articles, possibly establishing a regular PETRRA slot in every issue.

The AIS could also be a partner in printing the newsletter (see Human Resources section below).

Farm Broadcast, within the Ministry of Information (MOI), produces radio programmes that are aired daily from regional centres covering much of the country, one 5-minute programme at daybreak and a 25-minute programme that airs at 7:05 pm. Farm Broadcast also produces half-hour programmes on regional topics that air from 8:30 pm. In addition to discussions and interviews on-farm topics, Farm Broadcast produces listener-friendly jingles and dramas. We had a meeting with Imam Uddin, the Director of Farm Broadcast and his colleagues where they said that they would be happy to work with PETRRA to produce programmes. The broadcast schedule is set two months in advance. As Mr. Uddin pointed out many Bangladeshi farmers are illiterate, and only 20,000-25,000 of the 68,000 villages of Bangladesh have electricity for running television, radio is probably PETRRA's

best bet to directly reach large number of farmers.

Press releases, usually of about 1,000 words or less, should be sent out from time-to-time, to notify newspapers of developments.

Photo releases, which typically arise from VIP visits and the like, consist of one picture and a caption of 200–300 words. Press and photo releases can be recycled by posting them in the News section of the website and running them as items in the newsletters.

Popular leaflets can be developed from time-to-time from selected SP briefs. These provide the opportunity to show the links between advanced science to village level needs.

Procedures for **scientific communication**, in which researchers have papers published in scientific journals, will need to be addressed.

Target audiences

PETRRA must be able to communicate with a broad range of stakeholders. The information needs of the target audience should be served by information outlets as follows:

- Partners at a higher level (IRRI, MOA, BRRI, DFID) with the website, English newsletter, press and photo releases and popular leaflets;
- Partners in implementation (international research institutes, national research institutes, NGOs, and universities) with the website, press and photo releases, popular leaflets, English newsletter and, where appropriate, Bangla newsletter;
- Uptake agents (government organisations and NGOs) with the website, English and Bangla newsletters, Farm Broadcast and *Krishikotha*; and
- Farmers with *Krishikotha* (via BSs), Farm Broadcast, posters and leaflets created with the participation of SP personnel.

Human resources

An Editor/Writer is the key person for coordinating and executing the communication strategy. Whether hired to fill a new full-time staff position, or borrowed/seconded to work on communication strategy full-time at first, and then perhaps cut back to a part-time basis later, the Editor/Writer must assume responsibilities for producing publishable-quality copies and liaising with the webmaster, designers, printers and other partners/service providers in publications and broadcasting. He or she must also assume final responsibility for meeting publication and broadcast deadlines.

A Webmaster/host service should be contracted to design, maintain, and host the website. Unless partnerships can be worked out for publishing the newsletters, it may simplify matters to have the same design company handle both the website and the newsletters.

As mentioned above, the AIS of the Ministry of Agriculture could be a useful partner in many ways. In addition to *Krishikotha*, the AIS produces one-page supplement for national newspapers on World Food Day and one or two other days each year (for each of which AIS needs a keynote article, which PETRRA can offer to supply). They also have apparently underutilised design capabilities and printing facilities that may prove useful for producing the PETRRA newsletters. They expressed interest in exploring partnership possibilities.

AIS can publish a Bangla newsletter and forge a separate partnership for publishing the English newsletter with the Forum for Information

Dissemination on Agriculture (FIDA), which is an Asian Rice Foundation (ARF) affiliated journalists' group that is about two years old and has around 10 active members.

Closing note

In its upcoming uptake methodology review, PETRRA may wish to consider inviting concept notes (CNs) for a SP on communication. Implementing the communication strategy, PETRRA cannot afford to wait for a possible SP for addressing communication uptake. However, such an SP, if commissioned, could provide useful synergies.

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Position paper on participatory research

Karen McAllister

Introduction

The Poverty Elimination Through Rice Research Assistance (PETRRA) project in Bangladesh is intended to be demand-driven, which means that local people define the priority areas for research according to the nature of the specific problems they face. It is also intended to be participatory and to involve local people in the research process, wherever appropriate. Some of the research activities that will best address locally defined needs will be upstream and it may not be appropriate to involve farmers in the research process. However, some of the activities will benefit from farmer involvement.

This position paper offers considerations for integrating participatory research into PETRRA projects. A brief overview of the main concepts of participatory research and an outline of key questions to consider when designing or assessing a participatory research project are presented as an Appendix.

Rationale for participatory research in PETRRA

The rationale for using participatory research may be functional – to encourage local participation in order to improve the effectiveness and relevance of the research to local people. For example, to develop farming technologies or management practices more suited to the local area and local needs, to target specific social groups, to work with local knowledge, practices or resources (seed preservation systems, germplasm), or to improve reach and speed of adoption of new methods and technologies.

Local participation in research may also build local capacity and support local *empowerment* or *social transformation*– strengthen local people's knowledge and capacity in decision-making about management of local resources or farming systems. This involves improving local awareness of and access to options, strengthening local people's ability to make informed decisions about these alternatives, and improving their ability to assess the results of their actions (Ashby 1996:16-17). Research, on-farm, or natural resource management will be more relevant and have greater local impact if capacity development is built into the research strategy by encouraging active involvement of local people in all stages of the research process. It is likely that experiential learning through participation in experimentation and research will be more effective at developing local capacity than training or technology demonstration.

Local capacity building through participation in research is important for *sustainability of research impact*. Communities are positioned in a rapidly changing global and natural environment with new and evolving external and internal pressures on their resources. Sustainability of the positive effects of research is related not only to the 'persistence' of the outputs (technology, resource management practices), but is

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related more to strengthening local capacity to adapt to these technologies and practices to their specific situations and to the rapidly changing circumstances.

Integrating local participation into research

Participation of local people can occur at *different stages in the research or technology development process and for different purposes* (problem identification and prioritisation, testing and experimenting, data gathering, monitoring, analysis, evaluation, etc.). *Different people or social groups* (women, men, poor, wealthy) may be involved. The type and level of local involvement that is appropriate will depend on the nature of the research problem and stage of the research, the capacity (experience, knowledge, skills) of the local people as well as the researchers to become involved in a participatory process, and the broader political situation.

Participatory approaches are *context specific and need to be constantly adapted and refined* throughout the research process. The approach taken will depend on the research problem and local context. *There is no 'blueprint' or 'correct' strategy, however, certain guidelines should be followed to ensure good practice.*

Considerations for participatory research in PETRRA

Avoiding local burnout. The increasing popularity of participatory methods has sometimes led to overuse and misuse of these approaches, and has resulted in local burn-out. Local people will be reluctant to participate in research if they have done so in the past and there have been no obvious benefits. There is no reason to expect people to participate in research that will not offer them a practical benefit, even if the ultimate 'goal' is in their interests.

Research should be in response to farmer needs. Without farmer involvement at an early stage in setting research priorities and defining criteria for appropriateness of farming technologies and practices being developed, researchers may produce products in which farmers have little interest and which will not be accepted or adopted.

Benefits of local participation need to be clear. There needs to be a clear understanding of how the research and local people will benefit from participation in the research process. Participation for its own sake is not sufficient. There are certain situations where it is more appropriate to use extractive or non-participatory research methods, to avoid raising local expectations or being caught up in detail, to obtain an overview of the issues, and to draw on a range of sources.

Local participation in research needs to be linked with other components of the research strategy, not treated as a separate component to fulfil donor requirements for participation.

Participatory research needs to be adaptive and responsive. The results of local participation should be fed back into the research process to influence subsequent activities and strategies, and research approach adapted accordingly.

Participatory research needs to focus on solving problems, not on using tools. Researchers should take care that participatory research does not become 'tool' or 'approach-driven'. Sometimes, more emphasis is placed on the application of different methods and approaches (participatory rural appraisal [PRA], participatory action research [PAR], multi-stakeholder analysis, etc.) than on the problems that the research is trying to address, and how these approaches can be best used to address them.

Researchers need to be cautious about raising local expectations. Local people's involvement in research is often motivated by a false perception that they will gain some sort of development assistance. Misunderstandings about expectations can lead to frustration and mistrust, and affect future involvement of local people in research activities.

- It is important to always be honest and open with local people about the purposes of the research and realistic about what they can expect to gain; and
- Tangible outputs in the short term are often essential to sustain local interest and enthusiasm.

Researchers need to be considerate about local time constraints. Farmers and rural people are often very busy. Local involvement in participatory research activities, workshops, training, etc. are often time consuming, and takes people away from their normal livelihood and income-generating activities. Therefore, participation in research has an 'opportunity cost' for local people. Local people may not be able to participate in research activities at certain times of the year, month or day because they have other commitments. Participation itself may add to the work burden or decrease leisure time of the very poor or women.

- The value of local participation to the research and to the local people needs to be critically assessed before deciding what and how much is appropriate;
- It is important to recognise the value of local people's time, and to design research activities so that they are most convenient for local people; and
- It may be necessary to specifically seek out the perspectives of the very poor who may not be able to spare time to participate in organised activities. One approach would be to go to the people, instead of having the people come to the researchers (e.g., interview women in the fields where they farm).

Issue of compensation. Because participation in research can take local people away from income generating and livelihood activities, compensation (with food, cash or other material incentives) has sometimes been used to relieve the burden on people's time and to motivate participation. This is problematic because it changes the nature of the relationship between people and the research. Material incentives create dependencies and can give a misleading impression that local people are supportive of externally-driven initiatives. They can be expensive, and can blind people to the need to solve their own problems. In addition, people begin to expect incentives for participating, and this destroys the chances of voluntary uptake and spread of the research outputs. When people are paid, the activities almost always stop at the end of the project (Bunch 1982). Furthermore, if little effort is given to building local skills, interests and capacity, local people have no stake in maintaining structures or practice once the flow of incentives stops (Pretty 1995:169).

The fundamental issue which underlies deciding about compensation is who will benefit immediately from the results of the research, specifically, what is the balance between the benefits to the local participants and the costs of participation (what they are giving up (time, income) to be involved). General guidelines on this include:

- If farmers are gathered or interviewed to provide researchers with information, and if this is not lengthy (2-3 hours) then compensation in the form of snacks is appropriate. This is also a social grace - providing a tea break;
- If working continually with specific farmers, then no compensation should be given for field visits, short

interviews, discussions, etc. Farmers should not be paid for participatory technology development or on-farm experiments when they are actively involved in the research process. Their involvement should be based on enthusiasm for the research;

- If farmers are taken away from their work for an entire day (such as for training), then it may be appropriate to provide money to hire alternative labour (if they are missing important farm activities). Alternatively, providing a small amount of compensation (a per diem, but not more than the standard daily wage) may be appropriate. This is important in order to avoid involving only elite farmers, since poor farmers may not be able to take a day off from income-generating activities. For full day participation, meals or snacks should definitely be provided. However, the incentive for participation must not be for income;
- If the research poses a risk to farmers' livelihood (such as less crop yield, etc.) then researchers should compensate for any loss in production related to the research; and
- If researchers are only borrowing farmers' land or labour, and farmers are not involved in the research directly (not true participation), then this should be compensated.

Quick participatory research methods do not replace the need for social science analysis. While 'quick' and 'dirty' participatory research tools can provide a good overview of local situations and needs, they may overlook important social issues which can only be understood by more in-depth social research. Often, technical projects aimed at improving rural livelihoods overlook the need for social analysis, which will greatly enhance the targeting, relevance and effectiveness of the results.

Local analysis and validation. Participatory methods make it easier for local people to express their interests and ideas, but there is little in the methodology which helps in interpretation of this information (why people do what they do and say what they do):

- When possible, it is useful to involve people in the analysis, or at least validate the results and analysis with them. This should be done during the research process, not only at the end, in order to get local feedback as the research progresses.

Local perceptions of the research. Local people may be hesitant to let researchers know what they truly think, may give 'correct' or 'expected' responses, or may present needs which they feel will fit the agenda of the researchers. Their responses may be based on their perceptions of what they can gain or lose by providing certain information, as well as suspicions about how the results will be used.

- Researchers need to be very clear to local people of the importance of understanding their true perspectives – that they want people to express what they really think; and
- Researchers should offer assurance that individual views will be confidential in case there is risk.

Researchers' attitudes. Researchers' attitudes can have a significant influence on the success of participatory research. Researchers often see themselves as experts and may view their role as 'advisors' or 'teachers' when working with communities. Local people also often view outsiders as more knowledgeable and powerful. Participatory research requires a reversal in this attitude making local people the 'teachers', or at least working from an equal level.

- Researchers need to be respectful of local people, and treat their concerns and perspectives seriously, even if these sometimes seem strange or incorrect;
- Researchers have important knowledge and information to offer, but they will not understand farmers' perspectives unless they are able to keep quiet about their own knowledge and listen patiently to what male and female farmers have to say; and
- Researchers with limited experience with participatory approaches should work with a skilled facilitator from the PRA Promoters Forum (PPF).

Participatory research needs to recognise a multitude of perspectives. Communities are not homogenous, and are composed of distinct social groups differentiated on the basis of gender, wealth, social status, ethnicity, caste, size of landholding, occupation, and so on. These different groups often have different knowledge about natural resource management and farming practices, based on their different livelihood roles and circumstances. They will also have different priorities for research, and will be affected differently (positively or negatively) by research results. Research, information and knowledge are not value free, and the selective choice of information from certain groups may benefit some people and disadvantage others. Relying solely on the opinions of village leaders, key informants or existing local organisations to determine who should participate in the research and to identify important issues is unlikely to be representative of the community.

- Researchers need to identify the different groups in the community who might be interested in or affected by the research, and consult or involve them in the participatory research process when appropriate; and
- Researchers need to be clear about who their target group is, and involve this group in the research (at least consult them about whether or not the new practices or technologies will be useful or realistic for their farming systems, what the constraints to adoption will be, etc.).

Participatory approaches need to address power and social dynamics. Social relationships and power dynamics influence how openly individuals will express their interests and needs in group situations. Often, the perspectives of more vocal or powerful individuals dominate, and can be mistakenly taken as representative of the community. This tends to overlook the interests of the poor. Certain groups or individuals (especially women and marginal groups) may be unable (or unwilling) to participate in group activities because of livelihood and time constraints, lack of information, powerlessness, feelings that the meetings do not concern them or that their views will be of little value. Cultural, social and religious norms may define who attends meetings and makes decisions, while fear and shyness may inhibit participation in group activities. Willingness to participate may also be affected by disinterest in the research process or distrust of how the research results will be used.

- Researchers need to be careful not to focus attention or favour the perspectives of more articulate individuals or organised groups, since this tends to favour the local elite;
- Researchers need to specifically identify and seek the perspectives or more marginal groups and women; and
- Researchers may need to disaggregate methods and results. It is sometimes important to work with different social groups or individuals separately, so that those with less social status or power are not overlooked and are able to express themselves. For example,

separate focus groups or mapping exercises can be held for women and men, and group research activities can be validated with individual interviews.

Gender issues: working with men and women. Women and men have different interests in the research process, based on their different livelihood roles and activities. Despite their important role in production, women are often overlooked in agricultural research.

- Researchers always need to pay specific attention to the different roles of women and men in production, and to involve women in research when appropriate;
- When identifying priority areas of research and criteria for technology development, women should be consulted as well as men, since their interests and needs may be different;
- Women may also be interested in active involvement in experimentation, training, technology development, testing and evaluation, etc. and researchers should involve them when appropriate;
- Women are often less vocal or less likely to be open when men are present. It is best to work with men and women separately; and
- It is best to work with a woman researcher or facilitator when working with rural women. This is especially important in Bangladesh villages, since many women stay in the home and are not be able to speak easily with men who are strangers and not their relatives.

Participatory research for 'learning intensive' versus 'uncomplicated' technologies. It is useful to distinguish between 'learning' intensive technologies and 'uncomplicated' technologies, since these can imply different approaches to local involvement in research. These terms relate to how easy it is for farmers to understand and apply the technology or practice, and are not related to the 'complexity' of the technology itself.

'Learning-intensive' technologies or practices include those that a) require significant changes in behaviour and which introduce new, complex concepts, and/or; b) require farmers to make informed decisions and to continually adapt the technologies or practices to site specific and changing situations. Examples include almost anything related to natural resource management (integrated nutrient management, water and irrigation management, integrated pest management, watershed management, etc.).

'Uncomplicated' technologies include those that farmers are already familiar with or that do not require a lot of learning to apply effectively. Farmers only need basic information in order to use them or to adapt/fit them into their farming system. 'Uncomplicated' technologies do not need to be constantly readapted or re-made according to changing conditions in order to be effective. In some cases, these need to be developed in the laboratory, not on-farm. Examples include rice varieties, certain agricultural tools, and technologies created in the laboratory (high tech and upstream genetic resources).

- In general, 'uncomplicated technologies' are those about which farmers do not need to learn a lot to use. However, researchers need to learn from farmers in order to develop a technology that fits farmers' existing systems and needs, and need to involve farmers in testing and evaluating intermediate and final results, and sometimes also in technology development.
- 'Learning intensive' technologies require farmers to have a deeper understanding about the technology or practice in order for them to be able to use or

apply it effectively. Assumption of uptake and adoption is not enough. Capacity development – beyond exposure and demonstration – needs to be a goal in order for the research to have impact at the farm level. This is important so that farmers are able to make informed decisions about adapting the practices or technologies to their specific situations, according to changing situations (seasonally, in response to specific environmental changes, etc.), and so that they are able to understand the impact of their activities and adapt accordingly.

- Involving farmers in the creative and learning process of research and technology development through experimenting along with the researchers can help develop more relevant and effective technologies or practices, and can strengthen local understanding and capacity to use and adapt the technologies and practices. This is in addition to involving farmers in setting research priorities, and testing and evaluating outputs of the research. The participatory research process should 'facilitate innovation and enhance farmers' capacity to observe, experiment, discuss, evaluate and plan ahead' (Deugd et al. 1998);

An important question is at what stage of technology development should farmers be involved (how far should the technology be developed before involving farmers?). Most certainly, it should not be the final product stage.

Research involving private versus common property resources. Private resources are those which are individually owned or managed (e.g., farm plots) and for which decisions about management (what to plant, how much fertiliser to use, etc.) are taken by the individual household and do not require consultation or agreement with other members of the community. In such a case, researchers should be aware of who in the household is responsible for the activities and decisions, and who will be the 'user' of the technology or practice being developed (men or women) when deciding who to involve or consult in the research process. In addition, it may be useful to distinguish between different types of households (poor, wealthy, landless, different castes, etc.), since these might have different interests in and criteria for the research outputs.

- Certain technologies and natural resource management practices deal with shared or 'common property' resources or with practices on individual farms that require collective decision-making between farmers, other members of the community or other groups. Examples include:
  - Watershed, irrigation, water or landcare management systems;
  - Community-based natural resource management of commonly owned resources (forests, grasslands, coastal or water areas); and
  - Community-run seed exchange and preservation systems.
- For management practices which require cooperation between farmers, or which deal with shared resources, who needs to be involved in research becomes broader than for privately owned resources. Researchers need to:
  - Identify all users of the resource in order to understand their perspectives and how they might be affected differently by the research;
  - Identify potential conflict situations and manage these;
  - Work with different interest groups separately so that perspectives of less powerful are not overlooked;
  - Include the perspectives of these different groups in decision-making and priority setting; and

- Integrate gender and social analysis into the research.

Institutional support needs to be obtained for Bangladeshi researchers involved in PETRRA participatory research projects. It is often the case that researchers who are working using participatory research methods are junior in the organisation. Furthermore, participatory research approaches are often marginalised relative to other research methodologies. Supervisors may be resistant to allowing their staff to work on participatory research issues, especially since these is often time consuming and require staff to spend time away from the office.

- Gaining institutional and supervisor support is critical if researchers are to be able to spend time in the field on participatory projects instead of other activities; and
- It may be necessary to get a written letter of understanding from collaborating institutions that supports local staff spending time on PETRRA's participatory research activities.

Working with facilitators. Bangladesh has an excellent forum (PPF) of skilled facilitators for participatory research. PETRRA participatory research will be greatly improved if these facilitators are actively involved in the research process.

- Researchers should spend sufficient preparatory time with the facilitator before entering the field site, in order that the goals and objectives of the research are clear to the facilitator, to decide together on appropriate participatory methods and tools for the research, and to decide on how translation will be handled;
- Researchers need to give sufficient warning to the PPF when hiring facilitators;
- When working with rural women, researchers should make special effort to work with a woman facilitator; and
- Researchers should take time to review results, research process and analysis with facilitators to get feedback and verify results and discussions.

Arranging meetings with farmers.

- When arranging meetings with farmers through partner institutions, researchers need to be as clear as possible about their time of arrival, as well as the date. Otherwise, meetings may be set and farmers may be waiting hours for researchers to arrive; and
- Ideally, when arranging participatory research with groups of farmers, researchers should consult with farmers about when they are most busy (season, time of day), and when they are most available to be part of the research process, and try to accommodate farmers time constraints. Busy periods may be different for men and for women, and may be different in different research sites.

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Appendix: Overview of basic concepts of participatory research

What do we mean by participatory research?

Participatory research is a term that is broadly used to describe different levels and types of local involvement in the research process. It encompasses a wide variety of research tools, methods and approaches (refer to Table 1), including such popular methodologies as participatory rural appraisal (PRA), participatory action research (PAR), rapid rural appraisal (RRA), and farmer participatory research (FPR). However, the heart of participatory research lies not in the tools and methods, but in the philosophy behind the approach, which implies a new perspective about research and a different relationship between researchers and the end-users of research results. A participatory approach recognises:

- That local knowledge, in addition to scientific knowledge, has value and can improve research and development activities;
- That involving local people, as partners in research, can help build local capacity, support local empowerment, and is often fundamental for sustained positive change.

Table 1. Methods used in participatory research (Pretty 1995:176)

Group and team dynamics methods	Work sharing, process notes, personal diaries, villager or shared presentations, team reviews
Sampling methods	Wealth or wellbeing ranking, social and interview maps, transect walks
Interviewing and dialoguing methods	Semi-structured interviews, focus groups, key informants, oral histories
Visualisation and diagramming methods (These methods help guide discussion and facilitate local people to analyse the issues being addressed)	Community maps, landscape transects, seasonal calendars, social and wealth ranking, matrix scoring, Venn diagrams, systems and flow diagrams

Types of participation in research

Because the term participation is used very broadly, it is useful to differentiate between different levels and types of participation in order to identify which approach best fits the research problem (refer to Table 2). In some cases, the concept of 'participation' has been misused to get local people to do what researchers or project leaders want, rather than as a means for involving local people in project design and strategy.

Questions to consider while designing a participatory research strategy or reviewing a participatory research proposal

What is the motivation for participatory research? (for local people and for the researchers)

- How will the research benefit from local participation? How will local people benefit from participating in the research?
- Why are local people participating? Is local participation truly voluntary or is it coerced?
- Was the focus of the research defined by local priorities and needs?
- Are the people interested in the issues that the research intends to address? (If not, perhaps the focus of the research is not relevant to the local situation or not locally defined);
- Is local people's consent to participate in the research informed and based on realistic expectations of possible outcomes? Are local people realistic

Table 2. Types of participation in research

Nominal/contractual participation (not truly participatory)	Farmers lend land or labour to researchers, in exchange for material incentives (wage, food, etc.). On-farm research often falls into this category. This is often considered participatory, but since local people have not been involved in the creative and learning process of the research, other than as passive observers or through provision of labour, they have no stake in prolonging the research activities.
Participation by information giving (not truly participatory)	Local people participate by providing information about the local situation, farming system, environment, etc., often through surveys or questionnaires. This is different from consultative participation because it is unidirectional, in which enumerators or researchers pose pre-determined or extractive questions with little scope for discussion.
Consultative participation	Researchers seek local opinions through consultation in order to make decisions about community needs and to design interventions or research strategies.
Active participation in experiments or monitoring	Partnership between researchers and farmers in on-farm experiments, farmers are actively involved in implementing some steps of the research.
Participation in decision-making and problem solving	Local people are involved in deciding what issues the research should address, what should be done, how to do it, and are actively involved in carrying out the research.
Collegial/self-mobilisation	Researchers are involved in strengthening research that farmers are already doing.

about what they expect to gain from the research, or do they have unrealistic expectations?

When and how should local people participate in the research?

- What types of research activities can be best done by researchers and require little farmer participation? What research activities are best accomplished by farmers?
- At what stage of the research process will it be most effective to involve local people?
- At what stage of technology development should farmers be involved? (How far should the technology be developed before involving farmers?);
- What type of farmer participation will be useful at different stages of the research? (e.g., experimentation, consultation, evaluation);
- How are local people involved in the research? Who implements the activities? Who analyses the information? Who makes decisions and sets the agenda? and
- Does the research require local capacity building, improved ability to adapt and decide, or behavioural changes? Does the participatory research process involve farmers as partners in the research process in order to learn from the process, rather than as evaluators of the research outputs?

Who needs to be involved in the research?

- Who in the community will be interested in the research and may be affected positively or negatively by the results? Is the research likely to affect different social groups differently? Men and women differently?
- Are the activities that the research addresses undertaken by women or by men? Are the interests and needs of men and women different?
- Who in the community has specific knowledge about the subject of research?
- How many farmers need to be involved? What groups of farmers? Men, women or both? etc.;
- Is it necessary to disaggregate the research activities and results according to different social groups? (men,

women, ethnic groups, caste, wealth, occupation) Which axes of social difference are important? and

- Are key stakeholders, such as local officials, encouraged to participate, if their support is needed to reach goals or increase impact of the project?

Institutional issues:

- What are the researcher and research institution commitments to a participatory research approach?
- Is there a commitment and flexibility to allowing the community to redirect the process? and
- What are the attitudes and values regarding local knowledge and local people?
- Is the partner organisation supportive of staff involvement in participatory research projects?

Is the methodology appropriate?

- What is the value of the specific tools and methods for the purpose of the research? Is this the most effective way of getting the information? and
- Will the methods used allow for the different groups affected by the research to express their perspectives and interests?

Table 3. Local participation in different stages of research (adapted from McAllister and Vernooy 1999:9)

Stage of local involvement in the research	Who* controls and makes decisions?	Who undertakes activities?	Who benefits from the immediate results?	Are different social groups involved, and are they considered separately or together?
Investigation, problem identification and diagnosis				
Setting of research priorities & goals. Defining research questions. (Deciding which problems to work on)				
Choosing research options and planning activities/experiments to address these problems				
Taking action and implementing experiments or activities				
Monitoring of activities				

*'Who' can either be interpreted as distinguishing between researchers and local people, or between different subgroups in the community who may have different interests in the research.

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