

# **Agricultural Services Innovation and Reform Project (ASIRP)**

**Extension for Sustainable Livelihoods in Bangladesh:  
The Evidence from Six Case Studies**

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## 1. INTRODUCTION

One of the responsibilities assigned to the Agricultural Services Innovation and Reform Project (ASIRP) is “to contribute... to the debate about the longer term development of extension services and the possible role that DFID and other donors may play in facilitating this... process”<sup>1</sup>. More specifically, the project is expected to develop “a draft sector wide framework for extension incorporating a livelihoods approach”.

A number of individual pieces of work are being undertaken in preparation for this task, one of which - “research into the social development context of extension services, and the contribution that extension can make to sustainable rural livelihoods” – forms the subject of this paper.

In outline, an attempt will be made:

1. to describe how a cross-section of extension services are provided in Bangladesh
2. to identify the factors shaping the responses of richer and poorer households and of men and women producers to the possibilities arising
3. to explain the impact of extension on the livelihoods of these different groups.

The framework for Sustainable Livelihoods Analysis (SLA) developed by DFID is used as an entry point (*see box 1*).

Findings are drawn from a series of case studies, each of which covers an activity pursued by a individual agency, and all of which have been written up as separate reports<sup>2</sup>. Each study was built in part on an analysis of secondary materials and in part on a field investigation. The field investigations were confined to single communities and were carried out over a period of four to five days by small teams drawn from the organisations whose work was being reviewed. Three were conducted in Bogra Sadar and three in Ghatail *thana* in Tangail District. Both of these areas are not usually subject to deep flooding and have *boro/t.amon* as the major crop rotation. The methods used included informal surveys, focus group discussions, individual PRA techniques and household case studies.

It should be made clear from the outset that what follows is *not* an evaluation of different approaches or particular organisations. No analysis constructed upon such a narrow empirical base could be expected to perform this function, and the exercise will neither prove nor disprove anything by itself. Its role is rather to generate hypotheses that might then be tested more widely<sup>3</sup>, and to offer a series of real life experiences against which different possibilities for the future direction of extension in Bangladesh might subsequently be assessed.

The remainder of the paper falls into six parts.

- Section 2 highlights some of the major changes that have taken place in the context in which livelihoods are pursued in rural Bangladesh since independence.
- Section 3 introduces the organisations and the activities covered in the six cases.

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<sup>1</sup> ASIRP 2000, p45.

<sup>2</sup> See Howes 2001 (a) – (e)

<sup>3</sup> This is the classic function of the case study as described by Casley and Kumar 1987, pp 127-8

- Section 4 develops an anatomy of the extension sector, identifying the key issues providers must address and outlining the range of choices available to them.

### **Box 1: Sustainable Livelihoods Analysis**

SLA builds, in the first instance on the idea that rural households have five types of **capital** at their disposal:

- *human capital*: which includes skills, knowledge, ability to labour and good health
- *social capital*: which incorporates the formal organisations, the more informal networks or connections, and the reciprocal and exchange relationships in which people engage
- *natural capital*: which covers both intangible public goods (e.g. atmosphere or biodiversity), and divisible assets used directly in the production process (e.g. land, trees or water)
- *physical capital*: which takes in both infrastructure (e.g. roads) and producer goods (e.g. tools)
- *financial capital*: including both stocks (e.g. bank deposits, jewellery or livestock) and flows (e.g. regular earned income or remittances)

Individual households may be comparatively rich in certain types of capital and poor in others, and there may be considerable variations in the overall levels of capital available to different households.

The way in which a household uses the various types of capital at its disposal is described as its **livelihood strategy**, and the effects of that strategy are known as **livelihood outcomes**. Outcomes may appear in a number of forms, including: increased income or well-being; reduced vulnerability; improved food security or more sustainable use of the natural resource base. All of this, in turn, may create the pre-conditions for the accumulation of additional capital.

The circuit running from capital, through strategy and outcomes back to capital does not, however operate in isolation. In the first instance it is affected by the **vulnerability context**, which is made up of seasonal variations (e.g. in the availability of food or employment opportunities), more periodic shocks (e.g. flood or drought), and longer terms trends (e.g. declining land availability or soil fertility). Secondly it is subject to the influence of **transforming structures** (i.e. government or the private sector) and the various **processes** (e.g. policy or laws) with which these are associated. The transforming structures and processes may also affect the vulnerability context.

Interventions of the type under investigation in this case form a part of the transforming structure. They seek to provide rural households with the means to modify their livelihood strategies, improve their livelihood outcomes, and build their capital base.

*(Derived from DFID, 2001, part 2)*

- Section 5 explores the broad impact of the approaches reviewed for the development of the five different types of capital identified under the SLA.
- Section 6 examines how the impact of the extension approaches reviewed has differed between richer and poorer households and between men and women.
- Section 7 identifies a series of issues arising from the research requiring further investigation and takes stock of what has been learnt about the comparative advantage of the various categories of service provider.

The paper is accompanied by an annexe in which pictures are presented of the livelihoods of different types of household, and the way in which these have been affected by the interventions reviewed.

## 2. AGRICULTURE AND LIVELIHOODS

### 2.1 Before the Green Revolution

Conditions in contemporary rural Bangladesh are, in many respects, remarkably different from those found thirty years ago as the country emerged from the war of independence. In this section, an attempt is made to set a context for the more specific discussion of livelihoods and extension which follows by tracing the key changes which have taken place during this period<sup>4</sup>.

#### 2.1.1 Agricultural production and household capital

In 1970 the population was approximately 70 mn. and was very largely concentrated in the rural areas. Agriculture was the mainstay of the rural economy. Patterns of production differed to some extent from one part of the country to another and varied considerably within particular areas according to land elevation. *Amon* paddy, transplanted into the rising floodwater of the main monsoon season, and grown mainly for subsistence, was the dominant crop. Often this would be grown in rotation with early monsoon broadcast *aus*, or with jute which provided the main source of income. In addition, a small winter season *boro* crop would be cultivated on land where manual methods of irrigation could be used to lift water from surface sources. Lower yielding broadcast *amon* was grown in lower more deeply flooded areas. Higher land would be used to cultivate vegetables and other minor crops including oil seed and pulses, whilst the highest land above the level of the flood waters, where homesteads were established, provided opportunities to grow fruit and other trees and a few other vegetables. Homesteads would also be used to keep some poultry and perhaps to one or two goats feeding, whilst small areas of land would be set aside for grazing cattle.

Agriculture research stations and an embryonic extension system had existed in the region that was to become Bangladesh from the early 1900's, but prior to independence, these had made little impact beyond the small commercial sector and the great majority of rural producers employed few modern inputs. Cultivation was based on indigenous and slowly evolving practices, informally transmitted from one generation to another and from farmer to farmer. Draft animals were used to till the land and in certain post harvest operations, and all other tasks were performed manually using simple locally produced equipment. Productivity was modest but annual deposits of alluvium from the flooding rivers, together with the rotation of

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<sup>4</sup> Findings presented in this section draw heavily on Hossain *et al*, 2001, Mahmud 1998, and Rogaly *et al*, 1999; and on views expressed by people from the study villages.

crops, the occasional use of fallow, the ploughing in of crop residues and the use of manure all ensured that soil fertility was maintained.

The stock of animals, equipment and housing was modest and land represented by far the most important source of capital for most households. Distribution, however, varied markedly between regions, with the relatively *minifundist* (small holding) areas of the east and the more *latifundist* region of the far north-west marking the two extremes. But everywhere this key resource was coming under growing pressure as increasing population worked in combination with an inheritance system under which land was inherited equally by all sons, to lead to reductions in overall farm size and fragmentation of holdings. This development was accompanied by marked variations in access, which in turn provided the basis for some of the key relationships by which rural life was shaped.

### 2.1.2 The hierarchy of farm households

Households, which might be either nuclear (with two generations) or extended (with three), formed the basic unit of ownership and operation, and could be divided on the basis of their access to land into five broad types:

- ❑ **large farmers**, who owned much more than they required for their own subsistence and would typically let most of their land out to others under sharing arrangements, the most common of which would involve a 50/50 division of the crop;
- ❑ **middle farmers**, with more modest holdings, who were more actively engaged in the management of their own land, and mainly relied on hired labour to cultivate it;
- ❑ **small farmers**, conforming broadly to the stereo-typical peasant farmer who depended primarily on their own labour to work their own land, and did not hire their own labour out to others;
- ❑ **marginal farmers** who might own a little land themselves, but depended primarily upon land taken in share-crop, possibly in combination with some hiring out of their labour;
- ❑ **the landless**, who had little or no arable land of their own or under tenancy, and depended primarily on selling their labour to others for their livelihoods.

Households at each level in the hierarchy might also sustain themselves to a limited extent by their livestock products, through trade, or by engaging in other occupations such as fishing and blacksmithing. In certain instances, these occupations might also be pursued on an exclusive basis by members of particular castes from the minority Hindu community. Finally, a few wealthier households were able to secure government employment. This offered the security of a regular if small income, accompanied by access to the resources administered by the state and the opportunities to exert influence with which this was associated.

A similar classification is still employed by the DAE, which offers a precise definition of each category in terms of the area of land operated (see *figure 1*). The classification does not allow for differences in soil fertility or household size, and neither does it account for non-farm livelihoods. As such, it is not entirely satisfactory as a means of distinguishing wealthier from poorer households, but in very broad terms most households in the lower two categories and the lower portion of the small farmer group will normally fall below the poverty line.

### 2.1.3 Agrarian relations and social capital

In addition to the ties arising between landlords and tenants or between land owners and labourers, relations shaped by money lending were also of key importance. The landless, whose non-agricultural activities were insufficient to sustain themselves through the long agricultural slack season, lacked financial capital. As a result, they were often obliged to enter into a form of debt bondage to larger farmers, where the loans advanced would subsequently have to be paid off through labouring at depressed wage rates. Tenants might also have to borrow at a time when rice prices were high and then repay immediately after the harvest when they were lower, thus effectively paying high hidden rates of interest. In the event of general shocks such as harvest failure or more specific difficulties such as the death or illness of a key family member, small farmers might also find themselves in difficulty, and have to mortgage out land to meet short term consumption requirements. This, in turn, would effectively make them into tenants of their own land and often ultimately lead to the complete loss of their most important asset. Whilst there were examples of poorer households being able to improve their economic standing over time (*for example, see annexe case 1*), far more would move in the opposite direction. In combination with the pressures of population growth already noted, the tendency over time was therefore for the proportion of households in the upper and middle reaches of the economic hierarchy to decline, and for the absolute and relative numbers of those lower down to grow.

Accompanying the zero sum, largely exploitative forms of interaction that have been described, vestiges of more benevolent relations, where the better off guaranteed some minimum material security for the poor, also remained. Horizontal kinship links, operating through a few closely linked households sharing a common residential *bari*, and sometimes extending via the wider patrilineage to the level of the community or beyond, could provide another important source of social capital. Often these would provide a medium for the reciprocal and mutually beneficial pooling of labour resources. They might also serve as a safety net affording assistance if illness should strike, or as a source of interest free loans in cash or kind in times of economic hardship. In addition, lineages might be mobilised to resolve disputes, or to assist in the organisation of weddings or funerals. Taken as a whole, these networks could afford a significant hedge against vulnerability and shocks, on which richer and poorer households could both draw.

### 2.1.4 Gender relations

A similar interplay between conflicting and co-operative interests could be observed within rural households, with gender providing the primary line of cleavage. A fairly rigid internal division of labour was observed. Women were almost exclusively responsible for child care, cleaning, washing, cooking, gathering of fuel and care of the sick. They also took on most of the agricultural tasks, such as raising small stock; cultivating climbing vegetables; selecting and storing seeds; and post harvest processing, which could be carried out in the immediate vicinity of the homestead. Men and women both played a part in rearing larger livestock, whilst men were almost entirely responsible for the conduct of field based operations taking place away from the *bari*. Men also took responsibility for marketing all but the smallest items which household members produced for sale, and for purchasing all domestic requirements from the market. Decision within households might be to a degree mutual, and women could certainly influence budgeting, but the final word would generally lie with the husband.

Women customarily moved to their husbands *bari* on marriage. Given continuing cultural restrictions on mobility, which weighed most heavily on the better off, this normally made it difficult for them to maintain regular contact with their families and the communities in which they had grown up. Finally, divorce was not uncommon, and often arose as a result of disagreements related to the payment of dowry.

## **2.2 Towards and more diversified rural economy**

Important elements of this earlier situation persist, but much has now changed. Whilst rates of growth have moderated somewhat of late, population has risen dramatically, and although some of the increment has been absorbed in rapidly expanding urban centres, much has remained in the rural areas, fuelling an intensification of the land fragmentation noted above. An already limited forestry resource has dwindled further to make way for agricultural production, whilst elsewhere agricultural land is itself being squeezed by house, road and other forms of construction.

### **2.2.1 The transformation of agricultural production**

The effects of this have so far been successfully counteracted by other developments. Of primary importance has been the intensification of agricultural production deriving from the high yielding varieties of rice and other cereals released from international research centres from the 1960's onwards. These were further developed through the emerging national research system, and delivered to farmers via the offices of the state run Bangladesh Agricultural Development Corporation (BADC). Irrigation has also played a critical part, with an initial emphasis on large scale gravity flow systems giving way to low-lift pumps and ground water exploitation using deep tubewells, which were themselves then overtaken by smaller command and more efficient privately owned shallow tubewells (STW). Other key elements in the HYV package have included chemical fertilisers and pesticides. A greatly expanded state agricultural extension establishment has played an important part in helping to introduce the new technologies to farmers, although in recent years this has been forced to re-trench following a reduction in World Bank support. Like seeds, the other inputs were initially supplied through BADC, and made available to farmers under loans from state banks. These, however, were generally not repaid, and under donor pressure, much of the supply system has now been privatised.

Despite the difficulties that have been encountered, the new technology has now spread across much of the country, with double and sometimes even triple cropping becoming the norm in areas where it has been introduced. As a result, output has increased rapidly. Irrigated *boro* has now overtaken *amon* as the primary crop, in the process helping Bangladesh to attain food grain self-sufficiency in most years. At the household level, production gains have helped to off-set the effects of secular decline in farm size and the addition of a second major harvest has reduced seasonal vulnerability and shortened the period of recovery in the event of the failure of a major crop. Although fears have sometimes been expressed about the capacity of smaller farmers to risk adoption, evidence suggests that they have actually embraced the new technology at least to the same degree, and perhaps even more intensively than their wealthier counterparts. The demand for labour has also increased, spreading the benefits beyond the confines of the landed classes and real wage rates have risen significantly. The areas of greatest concentration of the new technology now draw in workers on a seasonal basis from the poorer hinterland where it has yet to take hold to the same degree.

### 2.2.2 The growing importance of physical capital

Whilst land remains the pre-eminent form of physical capital, and largely retains its hold over the popular imagination as a mark of status and guarantor of security, other types of assets are now rapidly gaining ground. As noted above, irrigation equipment now enjoys a central role, and with the squeezing of grazing land and the reduction in livestock numbers, mechanical power tillers are now replacing animal draft as a means of land preparation. Post-harvest operations have also become heavily mechanised, although the centralised rice mill is now being challenged by smaller equipment in the form of the mobile thresher that has returned some activities to the individual farm level.

All of this has opened up new prospects for accumulation for the better off in particular through the provision of services and the possibility of exerting leverage over poorer producers. The development also has sometimes been associated with the emergence of reverse tenancies, where the better off seek to rationalise their operations by sharing in land during the irrigation season to consolidate their holdings under a single command. Parallel developments are arising at the same time in labour supply, where the landless are increasingly forming themselves into teams who negotiate contracts collectively with larger individual farmers, or with groups operating contiguous plots again under a single command. The combined effect of all of this has been to remove substantial areas of management and control over the production process from the individual farm household, and may ultimately see the emergence of larger scale farming “firms” based around STW command areas.

### 2.2.3 The deterioration of natural capital

Such developments may well aid productivity although the implications for equity are more difficult to predict. Other changes emerging more recently in the wake of the green revolution technology, are more unequivocally negative. Many affect the stock of natural capital on which all rural livelihoods must ultimately depend.

- ❑ Heavy use of surface water for irrigation has dried up waterways, in the process depriving fishing households, who are among the poorest groups in the country of their livelihoods.
- ❑ Over exploitation of ground sources has led to the drawn down of water tables, so that handpumps, on which poorer households depend for their drinking water and to irrigate their vegetables, may dry up for a part of the year.
- ❑ Certain irrigation pumps may also be put out of commission and the development may well be implicated in the arsenic poisoning problem that has recently arisen.
- ❑ The displacement of draft animals has reduced the supply of manure. In combination with the growing trend to rice monoculture, this has reduced soil fertility in general and organic content in particular.
- ❑ Vegetable and fruit production have been squeezed with especially adverse consequences for the nutrition and health of poorer children, although the trend is now starting to be reversed as improved communications give faster access to urban markets and the spread of electricity facilitates storage.
- ❑ Pest attacks have increased with the new varieties and with the elimination of jute, with its important cleaning properties. These have been counteracted by the use of chemical pesticides that, in turn, bring with them a range of shorter and longer term problems for human and animal health and soil fertility.
- ❑ The continuing use of chemical fertilisers may well be having the same effect and can also pollute waterways and further diminish fish supplies.

Four of the cases reviewed later aim, among other things, to address one or more of these emerging problems.

#### 2.2.4 The increasing significance of off-farm activities to livelihoods

The major changes taking place in agriculture have been accompanied by significant shifts in off-farm employment. Whilst most poorer households continued to depend upon crop based agricultural employment as a significant source of livelihood, other avenues have started to open up for to them.

- ❑ Men might engage locally in rickshaw pulling and work can also be found both locally or further field on brickfields or in construction, where wages of about 80 tk a day can be earned, especially in the winter season.
- ❑ Opportunities to labour in the Middle East have opened up although there has been some decline of late.
- ❑ Recent years have also seen a growing tendency for younger women to leave the village to seek employment as domestics or garment workers in urban areas.

These new opportunities have reduced the supply of those willing to work locally for other households and together with the increase in the demand for agricultural labour, have improved the bargaining position of those who continue to seek employment in the rural economy.

Finally, the emergence of the NGO movement has afforded the poor, and poor women in particular, much better access to financial capital in the form of credit. This has generally been used in the pursuit of traditional forms of self-employment such as trading and the processing of agricultural produce to add small amounts of value, all of which has again helped to diversify livelihoods, and reduce vulnerability by extending income flows further into the year. On occasions, NGOs have also been able to harness credit to new technical opportunities of the type discussed in the fifth and sixth cases below. In addition, their presence has helped to some extent to strengthen bonds between poor people, creating a new form of internal social capital, and in itself offers the poor access to a form of external capital for the first time.

Across the economic spectrum, livelihoods are therefore becoming more diverse and far less agriculture centred and land based. This may be illustrated by an example taken from one of our case study villages, where the following were found to be present:

- ❑ big farmers with trading and business interests who may share out at least some of their land and hire in all of the agricultural labour they required;
- ❑ professionals like doctors, lawyers and teachers who relied primarily upon their paid employment and share cropped out of the land which they owned to others;
- ❑ STW owners, who were middle farmers and traders, and who hired in all of the labour required for agricultural operations;
- ❑ blacksmiths who also derived some income from small farms and hired in all of their agricultural labour;
- ❑ small farmers who also derived some income from working as blacksmiths, and relied on a combination of family and hired labour to operate their land;
- ❑ small farmers who depended mainly upon their land, again relying on a combination of family and hired labour;
- ❑ small farmers who share cropped in land and operated it themselves;
- ❑ marginal farmers who worked their own land and hired some labour out to others;
- ❑ marginal farmers who mainly shared out their land and relied mainly on hiring out their labour to others.

- landless households depending wholly on employment and self-employment;
- landless households with no independent means of support.

Various other permutations of the elements covered above might also have been present. In addition, most strategies would have been combined, in certain cases, with the use of remittances from household members working elsewhere in Bangladesh or abroad. Finally, those of the poorer households will normally also have involved a comparatively modest element of male and/or female self-employment in micro-enterprises.

### **3. AN OVERVIEW OF THE CASES**

The selection of case studies discussed in this section of the paper was intended in the first instance to cover all of the major sub-sectors - from field crops, through to homestead cultivation, forestry, fisheries and livestock - with which extension deals. Next, a conscious decision was made to chose projects and programmes representing some of the best contemporary practice in Bangladesh, on the grounds that these would provide the most useful positive lessons for any potential re-organisation of the sector. An attempt was also made to include examples from each of the major types of provider by identifying two government, two international NGO and two national NGO activities. Finally, in order to be able to say something about impact and sustainability, it was necessary to select cases and locations that had already been in operation. This carried with it the cost of not always being able to look at the most and recent refined versions of the models under review.

#### **3.1 Thana Cereal Technology Transfer and Identification Project**

The first case was the *Thana* Cereal Technology Transfer and Identification Project (TCTTIP). FAO was the executing agency, working in partnership with the Department of Agricultural Extension (DAE). The overall objective was “assist Bangladesh to achieve and maintain cereal self-sufficiency and improve the diets and real income of the... poor”. More specifically, the project aimed to disseminate improved *t. amon* and *boro* varieties; to increase the efficiency with which inputs were used; and to promote other crops that could be grown in rotation with rice, in order to diversify cultivation and enhance soil fertility. Extension activities focused primarily on men and field based operations, with a particular emphasis on the needs of small and marginal farmers and the landless. The active participation of women was also sought through the inclusion of a smaller post-harvest component dealing with processing, storage and seed selection. A combination of three year block demonstrations and single season village nurseries and seed villages were used to promote the new approach.

TCTTIP started with a one season pilot in three *thanas* before launching a 26 district programme, and reached a national scale with one *thana* from all 64 districts within little more than two years of operations. Although extensive initial consultation exercises were conducted, this left relatively little opportunity to experiment with alternatives before alighting on a model for replication. Some variants on the basic approach were introduced as time went by, but the fixed and relatively short duration of the project left relatively little scope to ascertain or respond to the experiences of participating farmers or others directly involved in the implementation of the programme. Work was initially scheduled to last for five years, commencing at the end of 1995, but a two year extension was subsequently granted. The budget was \$7mn, 65% of which was provided by UNDP.

INCLUDE Figure 1 SHOWING CASES AND MAIN ACTIVITIES PROMOTED AROUND HERE

### **3.2 Strengthening Plant Protection Services Project**

The next case was the Strengthening Plant Protection Services Project (SPPSP). This was undertaken jointly by DANIDA and DAE, and took place against a background of growing crop losses through pest and disease attack and the increasing and largely indiscriminate use of environmentally harmful pesticides. Building on an earlier model developed by FAO, the project has attempted to promote a cheaper and more ecologically sensitive alternative. This combines Integrated Pest Management (IPM) techniques with a wider range of cropping practices designed to promote healthy plant growth, with the use of chemicals being kept to a minimum. The primary emphasis has been on rice production, where men comprise 80% of all trainees, but vegetable schools, where men and women participate in approximately equal numbers, have also been included. Farmers owning and making decisions about their own land have been targeted, which tends to discourage the marginal, many of whom are tenants. Activities commenced in 1997 and are again due to run for five years. Once again an attempt has been made to extend activities to one *thana* in every district during this period, although the ability to draw upon a previously tested model has meant that the constraints facing TCTTIP have largely been avoided. SPPSP has an overall budget of \$8.9 mn., of which 60% comes from DANIDA,

### **3.3 Interfish2**

The third case is provided by the Interfish2 project from the International NGO CARE. The underlying problem addressed is very similar to SPPSP, and staff were actually trained in the first instance by the same FAO team. A rather different approach has, however, evolved over time that is specifically designed to strengthen the capacity of small and marginal farmers to manage their rice fields whilst improving their living standards. A series of additional management practices, described as Low External Input for Rice Production (LEIRP), designed to increase output whilst minimising the use of commercially procured external inputs, have progressively been built around a similar IPM core. In addition, fish-seed production and fish production in rice fields, which were only taken up by a small minority of SPPSP farmers, form a central part of the package, together with the cropping of vegetables on the elevated dikes between fields. The emphasis has again tended to be primarily on men farmers, but a wider range of strategies have been deployed to secure participation by women in this instance. Building on earlier CARE initiatives commencing in the early 1990s, the project ran from 1995-2000, and was supported by a grant of £5.6mn (\$7.84mn.) from ODA/DFID. Further developments are now taking place under the successor GO-Interfish project which started in 2001.

### **3.4 NGO Gardening and Nutrition Education Surveillance Project**

The fourth case covers the NGO Gardening and Nutrition Education Surveillance Project (NGNESP) initiated by Helen Keller, another international NGO. Motivated by the need to address the growing problem of Vitamin A deficiency and night-blindness in children, NGNESP has sought to promote the increased consumption of leafy and other types of vegetables and of fruit by promoting home garden production and raising awareness of nutrition. Children from households with less than 0.80 acres of land have been found to be most at risk, and women from this category have been specifically targeted. The basic approach was first developed in a pilot project undertaken in the early 1990s, paving the way for NGNESP itself to begin in 1993. The project differs from all of the others cases considered in that direct responsibility for implementation has been sub-contracted to (predominantly NGO) partner agencies, each of which are supported for three years. The case considered here

saw HKI working in conjunction with the Rural Development Academy Bogra (RDA) over the period 1997-1999. The project as a whole is due to continue until late in 2002 and has been supported by USAID and NOVIB to the tune of approximately \$5mn.

### **3.5 The BRAC Poultry Programme**

The fifth case considers the poultry rearing programme run by the leading national NGO, BRAC, which has a general mandate to reduce poverty and empower the poor. The initiative has its origins in a small pilot conducted over a five year period in one district in the late 1970s, which then gradually spread to the whole country. Geographical expansion has been accompanied by the progressive extension in the range of rearing options offered to members, the addition of a range of supporting structures, and the testing and subsequent rejection of a number of other alternatives following feedback from staff and members. From 1986, poultry was incorporated into the organisation's wider Rural Development Programme (RDP), which primarily seeks to create additional employment and income generating activities. This has recently evolved into the BRAC Development Programme (BDP).

Implementation at the local level takes place through the village organisations that BRAC promotes, and is critically dependent upon the credit the NGO provides. Opportunities have been created for members, who are predominantly women drawn from the target group of marginal and landless households, to engage in a diverse range of inter-connected poultry rearing activities and related services. The NGO also plays a key role in producing and/or procuring essential inputs, often working in collaboration both with government agencies and the private sector. Under a separate initiative, known as Income Generation for Vulnerable Group Development (IGVGD), which is also undertaken in conjunction with government, BRAC has specifically sought to target destitute women, drawn from the poorest 10% of the population, who have generally fallen beyond the reach of development initiatives. The programme is partly self-financing but also receives support, currently running at a level of approximately \$0.8mn/year, from a consortium of donors including EU, DFID, CIDA, The Aga Khan Foundation and NOVIB, under the RDP.

### **3.6 Proshika's Social Forestry Programme**

The final case is Proshika's Social Forestry Programme. Proshika is another leading national NGO and has a mission to "facilitate an extensive, intensive and participatory process of sustainable development through empowerment of the poor". It works with landless households, marginal farmers and other poor groups and seeks in particular to promote women's interests. Primary locality based groups again provide a channel for the supply of credit and technical support and for awareness raising activities, but in a significant departure from BRAC's approach, a series of higher level federal bodies have been promoted in attempt seek to represent members' interest in wider forums.

Forestry work takes place against the background of the rapidly declining and seriously depleted national forestry resource, and is driven by the mutually reinforcing objectives of environmental protection and poverty reduction. The programme began in the 1980s and is ongoing. It now includes four major elements: private nursery development; the promotion of tree planting on individual homesteads; the establishment of collectively operated strip and block plantations on leased public or privately owned land; and tree planting initiatives undertaken in conjunction with educational institutions. Finance has come partly from a general fund provided by a donor consortium and in part from more specific projects

supported by agencies including the World Food Programme, the EEC and the national Thana Afforestation and Nursery Development Programme (TANDP)

#### **4. AN ANATOMY OF EXTENSION SERVICES**

Before embarking upon an intervention, a number of issues must be addressed.

1. What are the objectives?
2. What types of household will be targeted?
3. What procedures will be used to include or account for the interests of women?
4. What technical and other choices will potential participants be offered?
5. What approach to training and learning will be followed?
6. What forms of material support will be provided?
7. What strategies will be used to sustain, develop and spread new ideas?
8. How will resources be allocated between locations?
9. What types of information will need to be collected?

Drawing on the experiences of the six cases, an attempt is now made to illustrate the range of options available in each instance. Considered together, these help to provide a partial anatomy of the extension sector in Bangladesh as a whole<sup>5</sup>.

##### **4.1 Diverse objectives**

In the first place, whilst there is a good deal of overlap, it will already be clear that interventions may be characterised by a range of different objectives.

- All seek, in varying degrees, to bring about immediate and short term increases in production, and in some instances (NGNESP, BRAC) this is a primary consideration. In others (TCTTIP) this is mediated to a degree by longer term concerns to preserve and enhance natural capital. In others still (SPPSP, CARE Interfish, Proshika) these concerns come even more strongly to the fore.
- Differences may arise in how and to what end intended target groups are to be assisted. One case seeks exclusively to promote nutrition and a specific aspect of health (NGNESP). Others offer to provide varying combinations of consumption and income generating opportunities.
- In some instances (TCTTIP, NGNESP), the primary intention is to secure some directly material outcome. In others (CARE Interfish, SPPSP) the broader development of human capacities is given greater emphasis. In others still (Proshika, and to a somewhat lesser degree BRAC) a relatively narrow extension objective is harnessed to a broader project of social transformation.

The fact that objectives are diverse and that none can be regarded as inherently superior to any should be kept in mind when comparative statements are made in the points and sections that follow.

##### **4.2 Targeting by household type**

Each case takes a view on whom it is intended to target (see figure 2).

- SPPSP seeks to work only with those who own and are free to make independent decisions with regard to their own land. This has the effect of

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<sup>5</sup> What would be required for a more comprehensive anatomy is considered in section 7.3 below

excluding that part of the poorest (marginal) land operating class who cultivate land under tenancy.

- TCTTIP and CARE both look more to the poorer land operating classes as their focus.
- NGNESP and Proshika aim, in slightly different ways and in differing degrees according to the specific activities promoted, to span the range from the smaller land operators down through to the landless.
- BRAC only targets the “functionally landless” which includes the marginal category.

**Figure 2: Target groups by Extension Provider**

|                                   | DAE Projects |       | International NGO Projects |     | National NGO Programmes |      |
|-----------------------------------|--------------|-------|----------------------------|-----|-------------------------|------|
|                                   | SPPS         | TCTTI | CARE                       | HKI | P'shika                 | BRAC |
| <b>Farm type (acres operated)</b> |              |       |                            |     |                         |      |
| Large (>7.5)                      |              |       |                            |     |                         |      |
| Medium (2.5 – 7.5)                |              |       |                            |     |                         |      |
| Small (0.5 – 2.5)                 |              |       |                            |     |                         |      |
| Marginal (0.05 – 0.5)             |              |       |                            |     |                         |      |
| Landless (<0.05)                  |              |       |                            |     |                         |      |
| <b>Gender</b>                     |              |       |                            |     |                         |      |
| Women                             | (✓)          | (✓)   | ✓                          | ✓   | ✓                       | ✓    |
| Men                               | ✓            | ✓     | ✓                          |     | ✓                       |      |

**Key**

|   |            |     |                 |  |            |  |                 |
|---|------------|-----|-----------------|--|------------|--|-----------------|
| ✓ | Main focus | (✓) | Secondary focus |  | Main focus |  | Secondary focus |
|---|------------|-----|-----------------|--|------------|--|-----------------|

**4.3 Including women**

All of the cases considered make some attempt to secure women’s participation (see figure 2), but the way in which this is done, and the underlying motivation, varies considerably.

- The national NGOs seek and value women’s involvement in its own right, and have established single gender base groups as a means of channelling increasing volumes of resources in their direction. This provides a ready made

vehicle for securing their participation in more specific activities of the types considered here.

- NGNESP normally only works with women (although this position was reversed under the somewhat unusual conditions obtaining in the specific case that was reviewed), but its reasons for doing so are primarily instrumental.
- CARE has explored various options at different times. Initially it adopted a dual focus, with discrete gender defined areas of technology and separate cadres of men and women trainers. Next it opted to train all staff in all technologies, whilst continuing to run mainly separate men and women's FFS. Most recently it has opted for a whole family approach where men and women from participating households both get the opportunity to familiarise themselves with the full range of technologies promoted.
- The TCTTIP approach is similar to the earlier CARE model. Most resources go into training men in field operations, but women from the same households receive instruction in the selection and storage of seeds and other post-harvest operations.
- SPPSP, by contrast, seeks to involve women in all of its schools, although they only account for a minority of places in the numerically dominant rice FFS.

Over and above these specific differences, it is significant that the national and international NGO providers (or in the case of NGNESP, the NGOs with which it works) employ substantial numbers of women staff. They thus enjoy a head start over the DAE projects, where women employees are very much thinner on the ground, although in these cases it has sometimes proved possible for male staff to work effectively with women participants.

#### **4.4 Offering choice**

The cases differ with regard to the degree and types of choices offered to client groups.

- Both DAE projects promote alternative possibilities. SPPSP runs separate courses for vegetables and rice. TCTTIP supports three year and more intensively resourced multi-crop block demonstrations alongside single crop season and less heavily supported community nurseries and seed villages, as well as promoting four different crop rotations within the block component. But in each instance the decision about what should be promoted in any particular location is dominated by project staff. Most participants simply engage with the projects on a "take it or leave it basis". Furthermore, and in part because of the need for certain actions to be collectively co-ordinated, they are expected to follow an externally determined set of procedures once they have decided to take part.
- The element of choice widens somewhat with NGNESP, where participants have greater scope to determine for themselves which of the range of vegetables available through local nurseries and related channels they will grow.
- Proshika's members have similar options with regard to the species they grow and can also, within the bounds imposed by the resources at their disposal, decide whether to engage (either individually or in combination) in nursery management, private homestead tree production, or joint plantation initiatives.
- Much the same applies with CARE-IF2, although in this instance, synergism between individual components in the package offered encourages participants to adopt more than one at a time, and rice-fish cultivation can only successfully be pursued in concert with zero pesticide use under a rigorously enforced IPM regime.

- The range of options is widest of all in the case of BRAC's poultry programme, where members have a broad choice between rearing and support roles, and a range of further possibilities which they may then pursue in either instance (see box 2 for further details).

#### 4.5 Building human capital directly through training

The attempt to build human capital through a process of training lies at the centre of each of the cases reviewed, and of all extension work more generally. As already noted, this may entail a focus either on specific technical skills (broadly what happens with TCTTIP, BRAC, and Proshika), or a wider approach which seeks in addition to promote individual learning or group management and dynamics (as with the IPM cases, and to a lesser extent NGNESP). All of the providers considered use cascaded approaches, which typically work through three tiers, but may sometimes extend to four or even five.

##### 4.5.1 Staff qualifications and training

At the highest level, the national NGO programmes can draw on their sizeable cadres of professional staff to train trainers. The international NGO projects also have some in house capacity. The shorter duration DAE based projects have either built their own temporary capacity (as with the SPPSP master trainers, who were themselves first sent to gain experience internationally) or contracted the function out to others (as with the use of national research institute staff in TCTTIP).

At field level a number of different situations may arise.

- Trainers in CARE and the NGNESP partner organisations are specially recruited for their tasks and carry no other responsibilities. With the latter, HKI covers the full financial cost of supporting trainers from partner organisations for the three years for which the relationship continues.
- The national NGOs have semi-specialised staff. BRAC workers combine their poultry related work with more general responsibilities for livestock work as a whole. In the case of Proshika, staff dealing with forestry must also work as generic Economic Development Workers (EDW) serving groups in a number of contiguous villages.
- The DAE projects draw on the part-time services of district and senior *thana* level staff (TCTTIP) and a combination of senior *thana* staff and Block Supervisors (BS) (SPPSP). In both cases salaries continue to be paid from the Department's revenue budget, but are supplemented by modest expenses and honoraria from the projects themselves.

The nature of the training offered to trainers differs a good deal from one case to another.

- SPPSP and CARE-IF both follow the classic IPM practice of intensive season long residential courses, and CARE provides additional three day, and more focussed follow up courses on specialist topics as when these are deemed necessary.
- NGNESP offers three separate five day courses to trainers from its NGO partners, and three one courses on more specialised topics, backstopped by a quite intensive process whereby trainers are accompanied and directly supported in their own training activities.
- BRAC and Proshika prepare their staff, who may or may not have previous expertise in the technical areas in question, using starter courses of three weeks

duration, followed by occasional and shorter refreshers designed to up-grade skills in newly emerging areas.

- TCTTIP, which is instructing staff who will already have acquired much of the knowledge which they will subsequently be required to disseminate, manages with only a five day initial course in the first year, with two day follow up sessions in each of the next two years.

#### 4.5.2 Farmer training and learning

The direct training of participants may also take place in a number of different ways.

- SPPSP encourages trainers to work in teams of 2-3 with one “tag” member who has not been formally trained themselves, but learns on the job from those who have
- BRAC is able to draw on a combination of its own staff and specialists from the Department of Livestock, whilst Proshika works alongside Forestry Department trainers for its roadside plantations.
- In other instances trainers work mainly by themselves.

Sessions may take place in a relatively formal classroom type setting at an office location (as with BRAC, earlier TCTTIP approaches, or Proshika nurseries), or at some other centralised facility (like the RDA nursery or central nurseries for NGNESP). In other instances, (SPPSP, CARE-IF2, Proshika homestead and roadside plantations, and later TCTTIP models) activities may take place around participants’ homes or in their fields. This is normally more convenient from their point of view, and offers particular advantages for women whose mobility may be constrained both by custom and the regular domestic responsibilities they must perform. Where centralised locations are used, which can be the only sensible option where a minimum number of participants do not live in sufficiently close proximity to one another, the style of training may be somewhat more formal and didactic. A more participatory and experiential approach typically characterises village based sessions.

Some centralised training can go hand in hand with a four tier approach where representatives of the client group are then expected to carry at least some responsibility for transmitting what they have learnt to others, although usually with accompaniment from staff (NGNESP and early TCTTIP). De-centralised training often seeks to facilitate farmer to farmer learning as a part of the repertoire of techniques employed (see in particular the IPM cases), and may seek to specifically prepare certain individuals to promote this type of exchange (as with CARE and HKI farmer leaders).

The intensity, duration, and frequency of training events varies widely.

- Mirroring the training of their trainers, SPPSP trainees participate in a single season long Farmer Field School (FFS) with 25 members, built around 14 weekly 3-4 hour sessions.
- CARE-IF also uses FFS of similar size, but offers a smaller number of less frequent classes each season, interspersed with more informal follow up sessions conducted in smaller groups. It also extends the school over three consecutive seasons, so as to cover a wider range of situations, and to progressively build higher levels of learner participation. Participants are encouraged to contribute to the evaluation of their own learning experiences and the planning of their own curriculum, which is unique among the cases studied.

- Having started with a somewhat different model, TCTTIP now also runs schools over an extended period (in this case three years) with three separate days in each of the two main seasons. This goes hand in hand with less frequent sessions for the wives of participants covering crop processing and storage and seed selection. All of the households with land under the five acre block, who might typically number 12-13, are represented.
- BRAC offers a range of centralised courses for each of the different types of rearer and support function promoted. Most last for only three days, but this extends to seven days for the more technically complex operation of chick rearing, to 15 for mini-hatchery operators, and 20 for poultry workers. In the last two cases, participants also receive one day of follow up instruction each month, and poultry workers are expected to provide a degree of ongoing support to other rearers in addition to their other responsibilities.
- The pattern with Proshika is similar with domestic plantation growers receiving one day, roadside plantation participants two and nursery operators seven days training.
- NGNESP also graduates its approach with one day of training being provided to ordinary group members (organised in groups of 15), three to leaders, and eight split between different session for nursery keepers. In this instance, however, frequent follow up visits are made, during which the instruction process can continue on a more informal and customised basis.

Whereas national NGOs are able to organise their training activities within or around previously established groups, all of the other organisations are obliged to create organisations for the specific purpose of delivering their training packages.

Nobody pays for their training. Indeed there is a strong presumption, deriving from wider national practice, that at least an element of payment will be offered in return for attendance at training events.

The research undertaken only afforded the most limited opportunities to actually observe training in process, and hence to form any impression of either the appropriateness of the learning styles used in relation to the needs of the client groups served, or of the capacity of the staff involved.

## **4.6 Contributions to physical capital**

### **4.6.1 Support during the project period**

Alongside the central thrust to build human capital, extension providers generally also offer an element of material (or physical capital) support in order to facilitate the initial process of adoption. This can take a number of different forms.

- TCTTIP supplies all the seed farmers require free of charge for the duration of their involvement in the project, together with nearly all of the fertiliser used in certain cases. A number of other items of equipment, including power tillers and pedal threshers, are also made available for shared use among clusters of groups.
- The Forestry Department supplies all of the material inputs required for the roadside plantations operated by Proshika members, although the cost is ultimately to be recouped through the receipt of 15% of the value of the final timber harvest.
- The NGNESP assists partner organisations to provide free seed and other inputs to central and village nurseries. Some free seed may also be advanced directly to farmers in the first instance when the supply chain is still in the process of

being established. But for the most part, vegetable growers are expected either to buy from the nurseries or to independently procure their requirements by some other means.

- CARE-IF and SPPSP contribute the inputs and other materials used on the group study plots, but otherwise expect participants to secure their own inputs and meet all of their own costs, although the practices advocated mean that these should in practice be less than would previously have been the case.
- BRAC supplies free starter kits for poultry workers providing veterinary services to rearers. It also takes responsibility for the physical procurement and delivering of key inputs to local centres, but users must then purchase them at full cost price. BRAC members engaging in all aspects of rearing or sector support are eligible for loans.
- This will also apply to Proshika nursery operators, although not to home garden plantations. None of the other providers considered offers credit, although TCTTIP has sought to involve NGOs and their members in its training activities in the expectation that this will help to establish a line of credit to some of the farmers who wish to adopt the recommended practices.

Taking account of the type of training required and the quantum of inputs supplied the extension agencies may be divided very roughly into two categories - the DAE projects and CARE who are spending approximately \$50 per direct participant, and the national NGOs and NGNESP, who are generally spending less than \$10.

#### 4.6.2 Sustaining input supply in the longer run

Various mechanisms are employed in the attempt to sustain a supply of inputs in the longer term.

- TCTTIP aims to help all of their participants attain levels of agronomic and related practice in cereal production that will enable them to then become suppliers of quality seed to the local market.
- NGNESP, with vegetables and fruit (*see box 2*) and Proshika, with trees, pursue similar objectives via nursery operators at a remove from the producer.
- BRAC uses the same strategy at a more elaborate level, by creating multiple and mainly free-standing linkages extending all the way from egg producers, through day old and young chick rearers, to mature bird rearers and egg sellers. But as noted above, and alone among the cases considered, this goes hand in hand with a continuing role for the organisation as a complementary/alternative, producer/procurer of key inputs and services (*again see box 2*).
- Many of these options, finally, may go hand in hand with significant elements of producer self-supply of inputs, for example, with some of the more familiar indigenous vegetables promoted by NGNESP, or with barter or other informal exchanges of materials taking place between producers in their immediate localities, as in the case of fish seed supply under CARE-IF.

### 4.7 Sustaining, developing and spreading new ideas

#### 4.7.1 Providing Ongoing support

Several providers seek to find other ways in which those benefiting from projects can help to support each other, and sustain impact once the period of the direct intervention has passed.

**Box 2: The BRAC poultry system is built on a combination of input supply from external sources and internal transactions between members.....**

- ❑ The starting point is provided by day old chicks, most of which are produced in large-scale, public and private sector poultry farms, or BRAC's own hatcheries. BRAC transports the chicks to area offices from where they are purchased by **chick rearers**.
- ❑ Chick rearers raise the chicks in confined and carefully regulated conditions until they are eight weeks old. At this point the greater majority are sold to **key rearers** who use semi-scavenging methods. Smaller numbers go to **model rearers** and to **cage rearers**, both of whom who practice total confinement.
- ❑ The mature birds kept by key and cage rearers produce eggs that are marketed via egg collectors. The eggs from model rearers go to **mini-hatcheries** that compete with larger scale enterprises to supply day old chicks to chick rearing units.
- ❑ In addition to those raising poultry primarily for egg production, there are a much smaller number of **broiler rearers**. They receive special chicks direct from BRAC farms, and raise birds intensively to the age of six weeks, when they are slaughtered for meat.
- ❑ All rearers use improved feed. Nearly all comes from large providers, including BRAC itself. The organisation trucks the feed to local offices where it collected by **feed sellers** for distribution.
- ❑ The entire sector is served by **poultry workers**, who provide vaccinations, medicine and other services to all rearers

**.....whilst NGENESP, through partners like the Rural Development Academy, (RDA) seeks to build a more independent village level capacity to supply seeds**

- ❑ In the first year, the RDA supplied central and village nurseries with foundation and certified seed from a range of 15 Vitamin A rich and other indigenous varieties, and with certified seed from five additional exotic hybrids. At the same time, in order that production could begin without delay, certified seed from nine mainly leafy and gourd species that were easy to grow and multiply would go directly to farmers. By the end of the initial period, these would be supplemented by seedlings, cuttings, and vines beginning to come on stream from the first village nurseries.
- ❑ In year two, RDA would continue to supply the nurseries and farmers with the same varieties, whilst introducing four new exotic species. By this stage, the village nurseries would have acquired sufficient expertise to start supplying seeds from a few, mainly indigenous, species directly to farmers, and to increase the range of indigenous and exotic seedlings made available. At the same time, the central nursery, which was seen mainly as a demonstration and training facility, would start to provide three types of indigenous and exotic seedlings to the village nurseries, and six types of indigenous and exotic seedlings direct to farmers. In addition, farmers would be able to start circulating a few different types of seeds and cuttings among themselves.
- ❑ In the third year, RDA would again continue to make foundation seed available to central and village nurseries. But as independent production capacity increased at intermediate levels, the range of certified seeds supplied to the nurseries could begin to be cut back, and the direct supply of seeds from RDA to farmers terminated.
- ❑ The process would be concluded in Year four, with the RDA and the central nurseries shutting down, the village nursery again increasing the range of seeds supplied to farmers, and farmers themselves able to produce and circulate an increasing range of seeds. By this point, the village nurseries would be able to supply good quality seed for most of the indigenous species first promoted by RDA, plus seedlings or cuttings for about half of the original exotic species; whilst farmers were producing good quality seed for about half of the indigenous species.

- Once their seasonal schools are completed, SPPSP has made some provision for initial assistance for former members to re-constitute themselves as farmers' clubs, which continue to meet from time to time to discuss problems and identify solutions, and generate resources of their own to fund ongoing operations.
- As indicated earlier, CARE goes a step further by actively seeking to foster learning capacity, to promote group dynamics and self-management, and to develop leadership skills during the much more extended period of the initial intervention, in order to provide a foundation for ongoing farmer to farmer interaction. CARE has also embarked upon a related and more ambitious initiative under which farmer leaders are drawn together into local federations which can both assist in the marketing of produce and serve as a vehicle for wider dissemination of the technologies promoted. NGNESP is currently considering the possibility of a similar initiative.
- By contrast with these initiatives arising around and out of specific technical interventions, the national NGOs are both able to offer continuing opportunities for ongoing support through their intra-village groups, and in the case of Proshika through village, union and *thana* level federations as well.

#### 4.7.2 Encouraging others to take part

In addition to the specific group of people with whom they work, most extension providers, and especially those operating in project mode, have strategies in place to try to encourage more widespread adoption.

- At its simplest, this can entail providing opportunities for others to observe project participants and then become secondary adopters themselves. TCTTIP, for example, organises demonstrations on contiguous plots of land in places where many people pass by, and continues them over a three year period to create a powerful, enduring and persuasive visual image to achieve precisely this effect. BRAC's tries to encourage a small numbers of "key rearer" in each village, who follow the simplest option it offers, with a similar end in mind.
- CARE goes a step further by allowing people who are interested to join in some of its regular activities as "secondary participants" and also provides opportunities for non-members to benefit from the informal follow up sessions that intersperse full FFS meetings.
- Both DAE projects regularly use seasonal farmer field days which provide opportunities for up to 500 farmers at a time to be given an introduction to what has been going on, and periodic agricultural fairs afford further opportunities of a similar nature.
- CARE also uses field days, although in a reversal of the complaint more normally made by government extension workers vis à vis their NGO counterparts, staff say the resources made available for this purpose do not match those provided for official events, which makes them difficult to arrange.
- As already noted earlier, both TCTTIP and SPPSP make provision for minority NGO representation in training events taking place at different levels. CARE has followed a similar tack, and has returned the compliment by including government staff in some of its own training and other activities.
- NGNESP, together with CARE in its new GO-IF initiative, take the process to its logical conclusion, by withdrawing entirely from front line extension themselves, and directing all of their efforts towards building the capacity of other, more local organisations, to perform this role. If successful this can clearly multiply reach and potential impact several times over.
- Their large memberships enable the big national NGOs to enjoy far greater reach without recourse to such devices, but their models may, on occasions, be imitated by others to achieve a similar effect. This has already happened to a

significant degree with the BRAC poultry programme, the effect of which has also been multiplied through the link up with government under the IGVGD programme.

#### **4.8 The geographical concentration of activities**

In combination with the marked variations in the amount of time and resources at their disposal, decisions taken about the scale on which interventions should operate have inevitably led to widely varying and distinctive patterns of resource concentration between the various extension providers.

- Only BRAC, with a presence in every *thana* and in some 80% of all villages, has been able to attain anything approaching blanket coverage, and even here, the average number of participants per village is only 25. Others have been forced to be far more selective.
- Some, like NGNESP, where there is a need to draw upon and sustain a shared facility, in this case, the village nursery, have opted for high concentrations of participants per village.
- Similar considerations of critical mass apply in the case of Proshika, where a desire to create organisations offering mutual support and affording opportunities for collective action figures prominently on the list of organisational priorities. Intra-village clustering also offers economies of scale in field based training and follow up support, which are important for CARE, and in the retrieval of credit by BRAC and Proshika.
- At a slight higher level, relatively intensive clustering of villages may be needed. For CARE and Proshika, for example, the formation of federal structures is integral to the model of development being pursued, either as a vehicle for higher levels of collective representation and action, and/or in order to pursue collective initiatives in marketing. A similar need to access common physical facilities, like NGNESP central nurseries, and economies of scale in the delivery of training and other services may also again apply at this level.
- TCTTIP, on the other hand, whilst only working in one *thana* per district, covers quite a high proportion of villages in each in an attempt to maximise demonstration effect and to make improved seeds available to as many farmers as possible.

#### **4.9 Learning and evolving**

Having considered what the different organisations do and how they go about their business, this final part of the anatomy section reviews the types of information they collected about their operations and the use to which this is put for institutional learning.

Whilst a degree of overlap exists, it is useful to distinguish initially between how this takes place in the projects run within the DAE and by HKI on the one hand, and in the big national NGO programmes on the other. The former exhibit a number of common features. All start with the establishment of baselines, and some also provide for the collection of control data, although the precise ways in which these tasks are approached vary considerably.

- HKI collected baseline data from all of its participants in the pilot area, and also established a control group with similar characteristics in terms of which direct before and after comparisons can then be made. It did not, however, seek to extend these procedures to its partners when activities moved to a national scale under NGNESP.

- SPPSP used a similar approach but was, by contrast, able to apply it to all of the sites where it operated.
- With TCTTIP, one control *thana* was established for each of the 26 *thanas* incorporated in the first round of project activities. Comprehensive data was then collected, using a combination of PRA and more conventional quantitative survey methods, from one village in each of the 52 *thanas*. This however, did not focus specifically on project participants, but covered the village population more generally, and therefore did not afford opportunities to make the kind of before and after or with and without project comparisons that were possible in the other two instances.

All of the projects have also established monitoring systems to collect routine data on inputs (eg training events executed), outputs (eg the numbers of people attending) and effects (eg the yields achieved), and have procedures in place for aggregation and analysis. But again there are significant differences in the way in which these tasks are executed:

- The DAE projects have standard forms for completion through their *thana* offices at the completion of each season.
- HKI, on the other hand, where vegetable cultivation proceeds on an almost uninterrupted basis throughout the year, conducts an ongoing series of three monthly surveys each based on a different sample of partner agencies and project sites.
- In an additional procedure, at the end of each season, SPPSP selects a cross-section of staff responsible for implementing activities to attend a meeting in Dhaka at which results are discussed and interpreted in the light of their experiences.

Over and above their routine data collection exercises, the DAE projects have been subject to more fundamental and externally executed mid-term reviews, whilst HKI called in a team of international specialists to evaluate the initial Panchagaor experience before going to national scale with NGNESP.

The two large national NGO programmes have evolved in a more organic fashion. Lacking the discrete starting and ending points characteristic of the other interventions, they have not collected baseline data as such. Monitoring data covering input provision and credit repayment is, however, collected through local offices and then aggregated up for consideration by management at the national level. At the same time, both BRAC and Proshika have quite extensive and independent in-house capacity to conduct more fundamental research covering the socio-economic impact and other aspects of their interventions. An additional layer of insights, which are most evident in the case of BRAC's poultry programme, arise from the attention of external researchers seeking to draw more general lessons from the activities undertaken.

CARE-IF presents a rather different scenario. Some baseline data is collected, elements of an "extractive" monitoring system is in place, and donor funding again goes hand in hand with the need for a comprehensive mid-term review. In this instance, however, much stronger emphasis than elsewhere has been given to enlisting project participants in the process of deciding what should be attempted within their groups, in formulating training curricula, and then in monitoring their own progress against agreed goals.

## **5. THE IMPLICATIONS FOR CAPITAL DEVELOPMENT**

### **5.1 How reliable is the data?**

In attempting to identify what impact the different interventions have had on capital development (in this section), and to determine their ultimate implications for poverty reduction, gender equity and sustainable livelihoods (in section 6), use has been made of secondary sources wherever these have been available. It has not, however, always been easy to determine how accurate or reliable these might be. Whilst keeping in mind the doubts which have sometimes been expressed by other observers, it has generally been assumed that they are reasonably accurate where there is not strong evidence to the contrary. Additional use has been made of the primary data arising from our own investigations, especially in areas like the equity implications of interventions, which other sources have generally not considered.

The relative degree of reliance upon secondary and primary materials varies from one case study to another, according to how extensive and accessible the former have proved to be in different cases. At one extreme lies the BRAC programme, where a lot of secondary material is already available, and where the fact that participants are not heavily concentrated within specific locations made a short field investigation more difficult to execute. At the other lies SPPSP, where the volume of secondary data was comparatively small, and the reliance on our own materials accordingly greater.

The caveat introduced earlier about the types of conclusions which may be derived from investigations conducted in a single location clearly applies most directly in such instances. Questions of the representativeness of any primary data used are especially relevant in the case of NGNESP, where in addition to selecting a single community as an example, a choice also had to be made of one from many potential partner organisations working under the project. In overall terms, the fact that primary research was conducted in relatively accessible locations, which are likely to have enjoyed at least their fair share of resources and staff time, suggests that the results will probably not normally fall short of overall intervention wide levels of performance. It would be tedious for the reader if everything that follows were to be hedged around with conditions and provisos. But it should again be kept in mind that any conclusions presented must be regarded as tentative, and should ideally be treated as no more than hypotheses warranting further discussion and investigation.

### **5.2 Human Capital Development**

#### **5.2.1 The transfer of knowledge to primary participants**

We begin with the question of the extent to which direct participants in the various activities described have been able to take on board the new ideas promoted. This is rather easier to establish in some cases than in others, but almost across the board, immediate adoption rates appear to have been high. In certain instances, it also appears that the initial stimulus of the intervention has set in motion a wider process of innovation among the farmers directly involved (see *box 3*).

There were, however, some relatively minor instances of recommended practices not being taken up at all, or being dropped during the period when the intervention was in progress.

### Box 3: How CARE's intervention has triggered a wider process of innovation

Over and above its attempts to transfer and disseminate specific sets of technical skills the CARE-IF project set itself the much more ambitious task of helping people to strengthen their general capacities to acquire, adapt and utilise knowledge. It is difficult to determine how much may have been achieved in this wider domain, especially at such an early stage, but there is already some evidence of new practices being taken up which go beyond what participants were directly taught by their field trainers.

One example is provided by the 60% of participants who have started by themselves to intercrop *sespania* with their *amon* paddy crop. Seedlings are first raised in a small nursery, and paddy is then transplanted with a gap left between each 6-7 rows, into which the *sespania* can itself then be planted some 15-20 days later. This serves a number of purposes. The trees provide perches for birds that then help to keep down the pests coming to attack the crop. The leaves falling from the plants added nutrients to the soil, and the plants, which are harvested some 20-30 days after the paddy, provide an additional source of fuel.

Other instances of adaptive learning were also encountered. Several farmers have begun to grow more vegetables in their fields, using techniques first learnt for dike cropping. Procedures for inspecting the quality of water in paddy fields to determine the its food content for fish culture are now being applied to pond fish culture as well. Two large farmers have converted paddy fields with a total area of 0.9 acres to commercial fish production ponds using culture techniques first learned in the school. More generally, people say that they are now better equipped to analyse the resources deployed in their agricultural and other work, thus increasing the efficiency of all of the operations in which they engage.

- In TCTTIP, one of the rice varieties promoted was found to be subject to lodging, leading farmers to search for a superior but longer duration alternative which, where adopted, squeezed the nitrogen fixing crop from the rotation. At the same time, the recommended mustard variety was not a success and was dropped by most farmers. Together, these developments at least partially undermined the objectives of diversifying production and enhancing natural capital. Initial resistance had also been encountered in relation to some of the suggested transplanting practices.
- With SPPSP, basic cultivation practices were taken on board, but only a small minority of farmers took up rice-fish cultivation and only a minority engaged in dike cropping. Similarly, not all participants engaged in all of the activities promoted under CARE-IF2, although uptake of technologies across the range was much higher here, and it was never anticipated that everybody should adopt everything.
- Under NGNESP, the key nutritional objective meant that attaining diversity and continuity of vegetable production was the central consideration, but the major breakthrough achieved in a pilot experiment was followed by more modest advances on the *status quo* when attempts were made to replicate the approach on a wider scale.
- In Proshika, tree planting and initial tending procedures were successfully absorbed, but some doubt remained as to the capacity of homestead and roadside plantation operators to conduct periodic maintenance in the form of pruning and thinning.
- With BRAC, certain members appeared unable or unwilling to follow suggested rearing procedures in the earlier years; although this issue has now at least to some extent been addressed through changes in recommended practice.

A range of factors help to explain why some of these difficulties have arisen.

- Adverse weather conditions have sometimes played a part, contributing to the lodging problem encountered by TCTTIP and sometimes making it difficult to harvest at 80% physiological maturity as suggested. Unexpectedly heavy rains, both at planting time (which has reduced the range of vegetables grown in certain years) and at harvesting time (which makes it hard to collect and store seeds) have similarly constrained NGNESP participants. In addition, both they and the CARE-IF2 vegetable growers, have sometimes also suffered from the draw down of water tables and the drying up of handpumps required for irrigation.
- Other external circumstances, such as power failure during the irrigation season, have adversely affected BRAC's capacity to keep vaccine in cold storage; whilst the periodic opening of the border with India sometimes leads to the market being flooded and domestic producers being undercut.
- New procedures may fall foul of existing labour practices. The method of transplanting advocated under TCTTIP took longer than its predecessor. This meant that it was initially resisted by some of the labour gangs hired to perform the task who were paid on the basis of a set rate for the completion of a given area of land, and not in terms of the amount of time actually devoted.

In other instances it appeared that staff preparation and/or availability could have contributed to the difficulties encountered.

- CARE staff express the concern that the comparatively large range of technologies promoted and the steady flow of new ideas being introduced in the course of the programme can make it difficult for them to attain sufficient competence in all areas. A similar problem could arise with NGNESP as a result of the large number of species of vegetables promoted.
- Proshika staff, with their relatively brief training, did not always seem to be sufficiently aware of good silvicultural technique.
- Together with BRAC, it also often seemed that staff had insufficient time to perform all of their duties to an adequate standard. This could lead to a tendency either to focus on the higher technology operations, such as nurseries and mini-hatcheries, or on producers with loans outstanding. As a result, other members, whose need for help might be at least as pressing, could sometimes be neglected.
- In SPPSP, pressure on staff time has again been a factor. The heavy workload entailed in running courses and discharging their other responsibilities has meant that master trainers have had insufficient time to visit schools and monitor progress as originally intended. Senior staff, who are expected to perform this role as well, have often been unable to provide adequate supervision because they have not undergone IPM training themselves. Members of *upazila* IPM teams have often been unable to provide the intended degree of support to FFS because of their involvement in a range of other project activities, and it has been unusual for all three team members to attend all sessions together as was originally planned.

None of these problems appeared, however, to be very serious.

### 5.2.2 Longer term retention of ideas

Once somebody has adopted in the first place, there was a high likelihood in all instances that they would continue to practice what they have learnt once the intervention has come to end. But this was not always the case.

- TCTTIP participants quickly returned to much lower levels of fertiliser use after the free supplies made available during the project period came to an end. They also reverted to individual seed beds where, by contrast with the collective beds advocated, they could save money by avoiding the need to hire labour. It was claimed that this would not, in turn, affect the synchronisation of planting, which was another key feature of the recommended approach, but it is difficult to see how this potential problem could altogether have been avoided.
- A small minority of CARE-IF participants lost fish due to excessive flooding, or were forced, through poverty, to consume the entire stock and had, as a result, ceased production.
- Proshika roadside plantation operators have not been able to retain their full stock of trees. Some losses have arisen as a result of adverse weather conditions, and much more occasionally trees have been destroyed by grazing animals or neighbouring farmers who fear the shading out of their crops. The combined effect had been to reduce survival rates to around 80% in the case observed.
- 2-3% of BRAC rearers drop out each year, but this can easily be accounted for by life-cycle and other individual factors, and would not appear to reflect very much on the technology and how it has been promoted.
- SPPSP, where only a short time had elapsed since the completion of the intervention, was more difficult to assess, although there seemed to be no problem here.
- NGNESP, where participants had much greater scope to shape their own adoption behaviour in the first instance, cannot readily be assessed.

### 5.2.3 The wider dissemination of practices

The adoption of new practices by participants in the various interventions has often exerted a wider influence within their communities and beyond. In nearly all instances this has been positive.

One way in which adoption may confer wider benefits is through increasing the supply of quality inputs to other producers.

- Such an effect is evident with regard to the Proshika nurseries, which make a range of seedlings available to members and non-members.
- It is also very evident in TCTTIP, where the grain produced from the demonstration plot is already in demand as seed in the immediate locality, and is even being purchased by official BADC seed farmers, who then sell it on to others as if they had grown it themselves.
- Things go a stage further with BRAC where, as in the case of the chick rearers supplying the various categories of mature bird rearer, it is actually other members who generate and consume each other's produce, in the process creating a mutually beneficial and self-sustaining network of relationships.
- Finally here, there is evidence from most of the cases of reciprocal and other informal exchange of materials arising from the interventions at household to household level.

Adoption by primary participants may also provide an example for others to emulate.

- Nearly all of the other farmers with land under the STW command where the demonstration plot was located in the TCTTIP case have adopted the new varieties promoted and most of the related practices, especially in *boro*. The same applies to many others in the surrounding village. But it is noticeable that

secondary adoption rates drop off the further from the demonstration plot one goes, suggesting that such an effect may take a considerable time to spread.

- With CARE, the two groups studied attracted eleven secondary participants, who were allowed to join Farmer Field Schools on an informal basis, and eight secondary adopters, who did not belong to an FFS, but subsequently took up some of the new practices advocated. The adoption and retention behaviour of secondary participants generally corresponded quite closely to that of FFS members from the same land operating size groups. Secondary adopters, however, appeared rather more inclined to engage in dike cropping and much less likely to adopt rice-fish culture than their primary counterparts.
- BRAC had a similar effect, with the ranks of those exposed directly to the programme expanded by more than 50% in the communities studied when secondary adoption was also taken into account. In a similar vein, a number of other householders are reported to have been encouraged to plant more trees in their homesteads by observing their Proshika neighbours doing so first.
- In another example, SPPSP FFS members suggested that some other farmers were already adopting the new recommended varieties; practising sowing in lines and sweeping; and using light traps and perching sticks. Those who had not had the benefit of attending a school were, however, reported to have encountered much greater difficulty in identifying and responding appropriately to different pests and protectors. In overall terms it was felt that secondary adopters had probably succeeded in increasing their yields by between 10 and 15% by 2000, which was significantly less than members themselves, but still a very substantial advance on their previous position. This raises the more general question of how far good practice might become diluted under different circumstances as a process of dissemination through secondary adoption takes place.

In a variant on this theme, it was found that more limited dissemination could also sometimes arise simply through participating farmers taking up new practices on their own fields elsewhere (as with TCTTIP). With SPPSP, farmers reported that, following their *boro* school, they had also generally made corresponding changes in *amon*, and where they had previously mainly cultivated BR11, they have now switched to more pest tolerant varieties such as Brridhan 30 or 32. Line sowing, balanced fertiliser use, regular survey visits to fields, and the use of biological or mechanical controls are now practised. The greater incidence of pests during this season means that some pesticide is still required, but quantities have been reduced, and members feel better informed about which brands to use when different types of pest arise. The application of the new ideas to vegetable cultivation, where pests were quite different, has been much lower, but farmers report that what had they had learnt about seed selection and fertiliser doses can, to some extent, still be utilised.

### **5.3 Building Social capital**

Attempts to build social capital have met with more mixed success.

In the case of the national NGOs, extension activities are able to utilise intra-village organisations that have already been established as vehicles for credit delivery and social development activities. With Proshika, federal bodies have also been established to represent members' interests at village, union and upazilla level. These structures all remain in place after training has been completed and the new production activities have been initiated, and may play a role in helping to sustain them in the longer term. Proshika's federations have, for example, provided support for road-side plantation caretakers facing difficulties with neighbouring land owners, and in negotiations with the Forestry Department to re-new leases and retain rights to ultimate timber products. In these instances, it should, however, be recognised that

members are not so much acting independently, as drawing down on the external social capital represented by the NGO which intervenes on their behalf. Whilst the new activities may have helped to some extent to strengthen the social capital vested in village organisations and higher bodies, the lines of causation run mainly in the opposite direction.

With the international NGOs and the DAE projects, which lack the capacity to provide support in the longer run, there is less evidence of any enduring impact on social capital.

- Groups established under the NGNESP partner case that was studied seem purely to have been convened for the purpose of delivering initial training, and not to have assumed any ongoing significance. When interviewed, former “members” could often not identify which group they had belonged to.
- SPPSP farmer groups designed to have a continuing post-intervention role have only been promoted in a small minority of cases and do not seem to have made very much impact.
- The CARE groups studied under this research reported that they had not re-convened as such in the post-FFS period. A key issue here appeared to be that farmer leaders, who had been expected to help keep things going, had not been paid, and were therefore not taken very seriously by other villagers.
- The federations envisaged by CARE (and under consideration by NGNESP) were at too early a stage in their development to assess with any confidence. General experience suggests, however, that when such bodies arise in response to the prompting of an external agency and are expected to develop at a pace driven by some externally imposed timetable, sustainability can often be a problem.

But social capital development was not only a question of the persistence or otherwise of formally constituted bodies, and some instances of more informal types of interaction arising from the interventions were encountered.

- In the case of CARE-IF2, one or two informal gatherings, attended by between five and fifteen members, had been held each season to review the merits of different varieties, to co-ordinate transplanting so as to reduce risk of pests, and to discuss problems such as a pest attack. These, however, may not have gone very far beyond the kind of exchanges which might have been expected to take place between quite closely connected people anyway.
- Several examples of reciprocal and other informal exchanges of material were found, each of which seems likely to have contributed in a modest way to the strengthening and extension of previous social networks. These included the exchange of seeds under TCTTIP, of seeds and seedlings in NGNESP, and of vegetables and fish seed under CARE-IF2.

#### **5.4 Contributions to physical and financial capital**

Contributions to physical and financial capital are not always easy to assess.

- There can be major year on year variations in external conditions such as the timing and extent of rainfall that, in the short term, may have a far greater influence on outcomes than any change in practices. This is a particular problem where studies are being conducted only a year or two after an activity has been completed, and especially affected the TCTTIP and SPPSP cases.

- Earlier or other ongoing projects with similar objectives may affect outcomes, as in one of our study villages where both NGNESP and Care had sought to promote vegetable cultivation.
- Longer term changes may already be occurring in the area of production which the intervention is trying to influence, as was the case in Helenchapara, where a trend for more field based vegetable production had already begun prior to the arrival of NGNESP.

Keeping all this in mind, and assuming an average annual household income of approximately 63,000 tk.<sup>6</sup> it appears that most of the cases considered have had a modest, but significant impact, with much greater returns arising in a smaller number of instances.

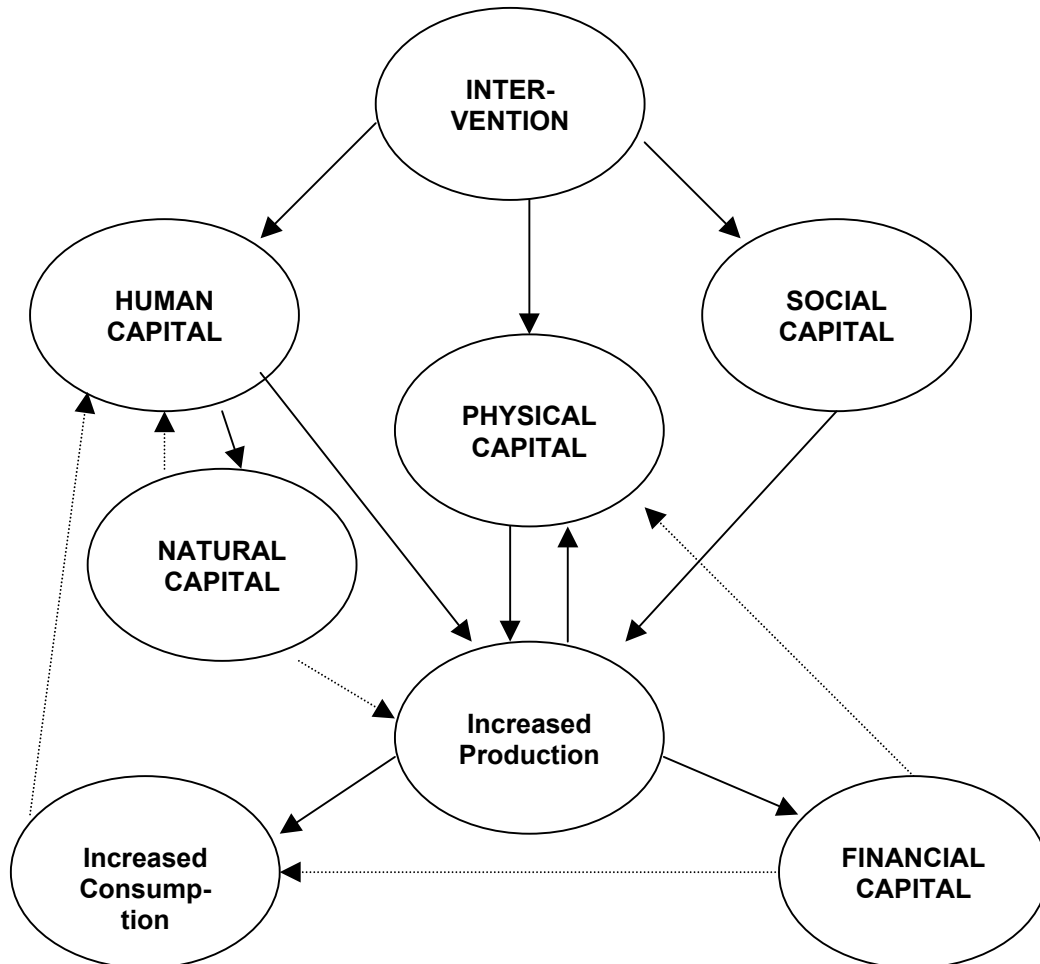
- In BRAC, basic key rearers of mature birds, who account for more than 90% of all participants, secure a net annual income<sup>7</sup> of about 1,400tk from the activity. Poultry workers, who put in a lot more time, might typically end up 4-5,000 tk better off. These figures rise to 8,600 for chick rearers, 11,800 for cage rearers, and 34,000 for broiler rearers, although the number of participants falling into this category is very small.
- Levels of output for the typical participant under NGNESP with an average of 4.5 different types of vegetable being grown and only 20 kgs being produced/month, meant that most produce were consumed, and average annual income was only 1313 tk. But, this would typically rise to about 8,000 tk for a village nursery keeper, and the exceptional and more commercially oriented vegetable producer benefiting under the programme might secure a net income of anything up to 50,000 tk.
- A simple year on year comparison of the results achieved under SPPSP suggested an additional income of 5000 taka/crop (or 10,000 tk./year) from a typical holding of just over an acre. A with and without project comparison indicated a more modest, but still very significant advance of 1750 tk.
- In the more complicated case of CARE, increases in output and reductions in expenditure might leave a one acre farm about 8,000 tk per year better off. Most additional vegetable production seems to have been consumed, but 1000 tk worth might typically be sold. About half of all fish was consumed, with additional income on the range of 500-2000 tk/year reported.
- The TCTTIP case offered a multiple crop rotation, and traversed three quite different years. A further element of complexity arises in this case as the result of the possibility that output may sometimes be used as seed, which commands a higher price, and sometimes as grain. Depending upon the precise assumptions made, net additional annual returns under the project on a typical 1 bigha (0.33 acre) area operated would vary from virtually zero up approximately 7000 tk, whilst farmers, with no seed and fertiliser costs to carry, would be some 2,000 tk better off.
- A Proshika nursery keeper could reasonably expect to net 25,000 tk/annum from their enterprise, although this might be doubled or more under exceptional circumstances. Most homestead planters would be of the order of 400/year better off, but for those with rather larger homesteads, this could rise to about 900 tk. Roadside plantation operators would receive virtually nothing on a regular basis, but could expect to receive an average of about 12,000 tk after 15 years when the trees were felled.

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<sup>6</sup> Hossain 2001, p 15

<sup>7</sup> This figure is based on the total value of production. In practice households consume a modest proportion of their own produce so the actual cash generated would be slightly smaller than this figure.

**Box 4: The impact of interventions on household capital formation**



- ❑ All interventions seek to directly build human and social capital and most, in addition provide physical capital or access to credit through which it may be obtained.
- ❑ Strengthened human capital may contribute to enhanced natural capital, which in turn can then feed back to human capital (eg through improved health arising as a result of reduced pesticide use).
- ❑ The new types of capital provided by the intervention and the enhancement in natural capital all contribute to additional production.
- ❑ Some of this may be consumed and feed back directly to human capital via improved nutrition. Some may be retained (in the form eg seed or eggs) as physical capital for subsequent rounds of production.
- ❑ Some will be converted onto financial capital, which may then be retained, consumed, or converted into physical capital.

## 5.5 Augmenting natural capital

Finally, several interventions have contributed to the building of natural capital:

- The IPM promoted by SPPSP and CARE sometimes augments natural capital, and sometimes reduces the rate at which it would otherwise have been depleted. Green manuring and improvements in the storage of compost have contributed to increased soil fertility. So has the virtual elimination of chemical pesticides and the marked reductions in the use of chemical fertilisers, which might otherwise have accumulated in the soil. These measures also appear likely to help to reduce levels of water pollution and the harmful effects on fish populations.
- NGNESP and TCTTIP have both continued on a more modest scale to the promotion of soil fertility through green manuring.
- The tree planting encouraged by Proshika contributes to CO<sub>2</sub> absorption.
- Whilst the BRAC poultry programme makes no direct or obvious contribution in this area, steps have still been taken to ensure that the larger operations involved do not have any negative environmental effects

Box 4 provides a general model for identifying the relationships between the different types of capital development that have been discussed.

## 6. WHO BENEFITS AND WHY?

### 6.1 Targeting and participation by socio-economic class

Different categories of household participate to varying degrees in the opportunities offered by the individual providers (see *table 1*). Most participants in each instance fall within the intended target group, but a significant minority do not, indicating that, in practice, a somewhat relaxed attitude often seems to be adopted. Sometimes, the participation of non-target group members, whose views are respected and who are in a position to offer a lead in their respective communities may actively, if quietly, be encouraged. The owners of the STW site around which the TCTTIP demonstration block was organised, and of the SPPSP and CARE study fields all provide examples. CARE-IF2 school members are on average actually better off than the community from which they are drawn and include a substantial minority of better off non-target group households. Similar, but somewhat less pronounced “drift” up the economic hierarchy can be observed in each of the four other cases where there was a stated intention to focus on poorer households to the exclusion of the non-poor.

#### 6.1.1 Including the poor and reducing poverty

The table indicates clearly that only the national NGOs are able to direct most of their resources towards the landless and marginal groups where the great majority of households will lie below the poverty line. Others, like NGNESP, have tried to follow suit, but initial success in recruitment has often been followed by high rates of drop-out by households lacking the resources to participate fully in the activities promoted.

The strong performance of the national NGOs in this regard reflects their ability:

- to offer credit for investment;
- to provide institutional support to defend the interests of members where these are neglected or threatened by other more powerful parties;
- to offer a choice of technologies and occupations.

**Table 1: Distribution of participants by land holding category**

| Land holding category          | Large | Medium  | Small   | Marginal | Landless |              |
|--------------------------------|-------|---------|---------|----------|----------|--------------|
| Area operated (acres)          | >7.5  | 2.5-7.5 | 0.5-2.5 | 0.05-0.5 | <0.05    |              |
| <b>% households in village</b> |       |         |         |          |          | <b>Total</b> |
| CARE                           | 2     | 16      | 42      | 25       | 17       | 100*         |
| SPPSP                          | ..    | 7       | 47      | 28       | 19       | 100*         |
| TCTTIP                         | 8     | 18      | 23      | 29       | 21       | 100*         |
| NGNESP                         | 2     | 16      | 42      | 25       | 17       | 100*         |
| Proshika                       | 7     | 14      | 36      | 15       | 28       | 100          |
| BRAC                           | 8     | 14      | 28      | 25       | 24       | 100*         |
| <b>% participants</b>          |       |         |         |          |          | <b>Total</b> |
| CARE: Fish seed                | 7     | 18      | 68      | 7        | -        | 100          |
| Rice Fish                      | 10    | 23      | 61      | 6        | -        | 100          |
| Dike crops                     | 7     | 18      | 70      | 7        | -        | 100*         |
| Low input ag.                  | 6     | 17      | 70      | 6        | -        | 100*         |
| IPM                            | 6     | 18      | 69      | 6        | -        | 100*         |
| SPPSP                          | -     | 10      | 70      | 20       | -        | 100          |
| TCTTIP                         | -     | 7       | 79      | 14       | -        | 100          |
| NGNESP                         | 1     | 11      | 64      | 14       | 11       | 100*         |
| Proshika: Caretakers           | -     | -       | 33      | -        | 67       | 100          |
| Roadside                       | -     | 6       | 36      | 38       | 20       | 100          |
| Homestead                      | -     | 9       | 53      | 34       | 3        | 100*         |
| Nursery                        | -     | -       | 100     | -        | -        | 100          |
| BRAC+: Poultry worker          | -     | -       | -       | 50       | 50       | 100          |
| Key rearers                    | -     | -       | 27      | 64       | 9        | 100          |
| Model rearers                  | -     | -       | -       | 100      | -        | 100          |
| Chick rearers                  | -     | -       | 67      | 33       | -        | 100          |
| Broiler rearers                | -     | -       | 100     | -        | -        | 100          |

\* Rounding error

+ Includes secondary adopters

Shaded areas = categories outside stated target group

Critically, both BRAC and Proshika are able to offer some options that can be pursued by very poor households without any land at all.

- ❑ Landless BRAC members may secure permanent positions as poultry workers, feed suppliers and egg collectors, all of which offer quite good incomes. In addition, if they have sufficient space in their homes, it may also be possible to engage in basic key rearing with a small number of mature birds.
- ❑ The presence of a powerful organisation representing their interests has enabled some of the poorest Proshika members both to benefit from employment opportunities in establishing and tending roadside plantations, and to acquire rights to a substantial disposable asset in the form of the trees (see *annex case study 4*).

The numbers of people able to benefit in these ways have, however, been rather small, and it is the moderately poor marginal households, with a small amount of land at their disposal, who have generally been better placed to take advantage of the new opportunities arising (see *annex case 3*).

In these instances, and more exceptionally among the landless, interventions have led to significant reductions in vulnerability.

- An increased flow of income from eggs, which continues throughout the year, offers some protection against seasonal shocks. Improved fodder and fuel availability from homestead and roadside trees has a similar effect. So too do the new service occupations which both BRAC and Proshika have created. Taken together, all of these things have also contributed to a reduced risk of indebtedness.
- At the same time, widening the range of livelihoods available to poor people gives a better hedge against periodic and potentially more serious shocks, and provides capital in the form of chickens and trees which can be liquidised if the need should arise.

The degree of additional protection afforded, as the discussion in section 5.4 above has indicated is, however, likely to be quite modest. By the same token, the proportion of very poor households moving up to the poor category, and the proportion of poor becoming non-poor as a result of their participation in the activities described, are both likely to be quite small.

#### 6.1.2 Marginal farmers and land-based activities

Marginal farm households are generally under-represented in all of the land-based activities promoted by the DAE and the international NGOs. There appear to be a number of reasons for this.

- Most are heavily dependent upon off-farm employment and self-employment alongside their farming activities and may find it difficult either to attend regular training sessions, as in SPPSP. They may also find it hard to put in the regular time required for the new practices to be effective, as with IPM under SPPSP and CARE-IF.
- With rice-fish cultivation, successful operation depends upon access to land with rather specific characteristics, which may rule out certain smaller operators who have a more limited range of plots from which to choose. NGNESP and Proshika's domestic plantations only require a small parcel of homestead land, but in either case those with more space at their disposal are clearly much better placed to adopt and benefit from the practices advocated.
- In some instances, a substantial investment is needed. With rice-fish cultivation, the plot has to be deepened and bunds raised in the first instance, and then maintained. Similarly, a Proshika nursery keeper has to buy a range of inputs and employ a number of people before returns start to come on stream. Even in the case of the big NGOs, where credit can be made available, the poorest people may exclude themselves from such activities for fear of the risks involved.
- It also appears likely that relatively inflexible DAE extension packages may not fit the resource endowments and propensity to take risks of this category of household.

Where marginal households participate initially, it can be difficult for them to continue in a second or third year. In CARE-IF2, for example, poorer households were found to be more likely than others to consume their entire fish harvest and thus lack the seed

to start again in the next season. They were also more likely to have used a sub-optimal plot and to be forced to give up after failing to realise the anticipated returns.

All of these considerations serve to limit the direct participation by the marginal, but the interventions in question still have indirect consequences which are felt through changes in patterns of labour demand and employment, and which also affect the landless. Taken as a whole, however, these tend not to be very large. Thus:

- People started to hire in labour to manage their collective seed beds under TCTTIP, which created more jobs in the short term, but then reverted to individual self-cultivation as soon as the project ended.
- IPM proved considerably more labour intensive than chemical approaches to pest control, but the additional work required involved a small input over an extended period of time and was nearly always performed by the land operator himself.
- Where vegetable cultivation was practised on previously uncultivated dikes more labour had to be applied, but where it displaced rice, or other field crops (as has sometimes been the case under NGNESP) then both labour demand and employment opportunities almost certainly fell.
- The introduction of peddle threshers under TCTTIP has had a small labour displacing and employment reducing effect.
- To the extent that TCTTIP, SPPSP, and CARE-IF have succeeded in increasing paddy yields, this will have led to corresponding growth in harvest and post-harvest labour requirements, which in turn are likely to be reflected in the creation of some additional employment opportunities.

Where labour demand increases and wage rates rise, this will normally lead to an increase in the amount of land offered to tenants, but little evidence of such an effect could be detected in any of the cases investigated.

### 6.1.3 Opportunities for small farm households

The results presented in table 1 suggest that it is nearly always the small farmers, most of whom would be a little above the poverty line, but some of whom would fall slightly below, who participate most frequently in the land based activities promoted. The numerical dominance of this group is partly a reflection of their status as the largest individual group in rural society, where they account for 37% of all households. But it is also a function of the fact that, as a group, they are relatively much more likely either than larger or marginal farmers to respond to the opportunities offered. This, in turn, appears to reflect the fact that they alone retain land based agriculture as the primary source of income and subsistence, and thus seek to do all they can to maximise their returns from it.

As a result of their participation, their vulnerability to seasonal and periodic shocks is reduced in the same manner as with marginal farmers, but the greater absolute area available for cultivation here means that the effect will be stronger. In addition, members of this group can benefit from regular flows of fish and vegetables for consumption in what previously would have been the hungry periods between the major rice harvests. Some of those a little below the poverty line might therefore be able to rise above it, and for the larger group of "tomorrow's poor" the prospect of a future descent into poverty recedes. But at the same time, the relatively modest scale of the increments to income and consumption and the fact that these are generally not sufficient to secure additional productive assets, means that vulnerability to major shocks remains. A few small farmers have, however, been able to achieve much more major advances as a result of some of the interventions (see box 5 for an example).

### **Box 5: A Proshika Nursery Keeper from a Small Farm Family**

Insah Ali Khan is 25. Together with his wife, two brothers and sister, he continues to live in his parents' compound. His father owns 60 decimals of land.

Three years ago, Insah had a grocery shop from which he was able to earn about 2,000 tk each month. In 1997 he borrowed 7000 tk from Proshika to expand the business. Not long afterwards, however, with 5500 tk still outstanding, the land upon which the shop stood became the subject of a court case and he was forced to stop trading. To help him out of his difficulty, he was offered the chance to train as a nursery keeper. He duly attended a six day course at the Area Development Centre. At the end of 1997 he was then given a further loan of 20,000 tk, which was to be repaid over a two year period. He was also provided with a small quantity of seeds and seedlings to help him get started.

Insah established his nursery on two small plots of land immediately adjoining the family compound. One, which comprises 25 decimals, belongs to his father. This was previously used to grow jute and vegetables and yielded an annual income of about 1200 taka. The other is 20 decimals, and has been taken on a three year lease from a cousin at an annual rent of 1000 tk. Insah now devotes most of his time to the management and cultivation of the nursery, and continues to tend the rest of the family land, as his father has grown too old to do much. His mother, who has been able to pass most of her previous domestic responsibilities on to Insah's wife, also contributes to the nursery on a regular basis. A neighbour has been contracted to make and supply the polythene bags in which the seedling are raised, and a team of men and women labourers is hired for a week each year to prepare the beds and soil.

Insah collects most of the seeds he requires himself, first identifying good quality trees and then seeking permission from the owner. He was now trained to do this by Proshika, but has been able to learn from other group members and the EDW. Most of the source trees are within a kilometre or two of his home, but some are as far as nine kms. away. The seeds are generally given free of charge, but small amounts must be spent on fertiliser and pesticide. The largest individual cost, accounting for more than 60% of total expenditure, is incurred by the hiring of a rickshaw van to take the seedlings to market.

Seedlings normally retail at 4 tk. each. Hardly any sales were possible during 1998 when the business was being established, and where some production was lost through the serious floods that occurred at that time. In 1999, gross income reached 15,000 tk and by 2000, it had more than doubled to 32,000. The entire nursery loan has now been repaid and Insah is hopeful that he will also be able to repay the outstanding balance on his earlier shop loan in the coming months. Production is likely to grow again in 2001, when total sales of 55,000 tk are anticipated. If achieved, these would mean that, for the first time, the net returns from the nursery business would have exceeded those accruing earlier from the shop.

With the business still in its infancy, and his loan only recently having been paid off, it is too early to see the full effect on the livelihood of Insah's household. Significant changes are, however already evident. Previously they shared a hand tubewell with a neighbour, but now they have been able to buy their own. They have been able to replace their thatched roof with tin, which means that repairs will now be required much less frequently and that the interior is cooler. They have also purchased a table, some chairs, a stool, and a display cabinet. In addition, the extra income will make it easier to buy the books and stationary which his younger brother and sister need for school, and opens up the possibility that they will now be able to continue for eight years, when previously they would have had to stop after five. If things continue to go well, Insah's ultimate ambition is to use his additional income to purchase more land.

#### 6.1.4 The response of medium and large farmers

Table 1 indicates clearly that medium and larger farmers, as a group, respond less enthusiastically to the new opportunities than their poorer counterparts. Many have business and other interests which take them away from their land on a regular basis, and offer better returns than the intensified agriculture advocated by SPPSP and CARE, and to a lesser extent by TCTTIP. Often they opt to lease out their land rather than operating it themselves. Those retaining a direct interest in agriculture may be inclined to pursue this through the sale of water for irrigation or by hiring out power-tillers for land preparation.

But when they do follow the new practices, the benefits they derive are generally greater than those accruing to other classes of land operator. A number of factors contribute to this advantage.

- They are better able to take the risks and make the investments required to access the higher technology, higher returning options like broiler rearing or rice-fish cultivation.
- They can afford to wait for returns to come on stream, which is important with relatively high return activities like nursery keeping, or hen rearing.
- They are better placed to withhold their produce from the market until higher prices are available, which is a particular consideration with rice, and even more so in the case of TCTTIP where a substantial premium is available for those who market their output as seed.
- They can access markets more readily, which is especially important with vegetables.
- With all land based operations they are able to apply any new and more productive possibility on a more extensive scale.
- As STW owners, they can enjoy the entire premium accruing from water saving measures under TCTTIP and SPPSP where charges are levied per unit land per season and not in terms of the actual volume supplied.

Finally, in certain instances large and medium farmers can identify and exploit new commercial possibilities arising out of the recommended packages. Examples included:

- the large farmer who has been inspired to develop a big fish farming operation in the CARE village;
- the bigger farmers who, at least in part through the stimulus provided by NGNESP, have raised the level of former paddy fields in order to convert them to commercial vegetable growing.

Together with seedling nurseries and some of the higher technology options promoted by BRAC, these are contributing to the emergence of a small business sector in the rural areas. This could be critical to the further development of the agriculture. It may also have an important influence on the future employment prospects of the poor, and represents a possible alternative for their advancement to the more direct targeting strategies that are currently being pursued. A particularly striking example of what might be possible was provided by the 10,000+ tk/year in income enjoyed by rickshaw pullers transporting seedlings to the market for the Proshika nursery keeper (see box 5). More work would, however, need to be done to take into account any employment displacement effects of the type likely to have been associated with the commercial scale vegetable farms indirectly arising from NGNESP.

## 6.2 Creating Opportunities for Women

As noted earlier, all of the organisations considered have made at least some attempt to include women. The extent to which these ambitions are realised in practice rests, in the first instance, on the question of economic class.

- Those from better off households, with significant land and other assets, are more likely to work immediately in and around the home and to have hired help with at least some of their work. This makes them less likely to engage in many of activities that have been discussed.
- The poorer are, of necessity, more mobile and less bound by considerations of social status affecting what they may undertake, and are in addition specifically targeted by national and international NGOs.

### 6.2.1 Extension activities and the gender division of labour

Over and above this, the degree to which women have been included depends quite heavily on the extent to which the activities promoted overlap with their position within the established gender division of labour.

- In TCTTIP, the major thrust of activities and support has been directed towards field operations and men's work, but a smaller component, focussing on women's role in the selection and storage of seed, has been pivotal to the overall success of the enterprise in multiplying improved varieties.
- The BRAC poultry programme also lies firmly within the established domain of women's work, and with the exception of a small number of feed suppliers, has worked almost exclusively with women participants. The system whereby different categories of participants are linked together as buyers and sellers of each other's produce (see box 2) has, however, proved highly significant in this instance. This creates a parallel market for women, where they can begin to engage in financial transactions and gain access to cash on a hitherto unprecedented scale.
- NGNESP, with its emphasis on homestead vegetable production, starts from a similar position. But the fact that vegetables may also be grown in the male domain of field crops, has created opportunities for men to take over to some extent. This is seen in its most extreme form in our RDA case study.
- CARE-IF, with its mix of classically male and female technologies, is more complicated. Men have accounted for 79 % of overall FFS membership, but at the same time the case presents interesting possibilities of women beginning to encroach on traditional male space. This is seen both through their engagement in dike cropping, where fields are close to the homestead, and through partial entry into fish farming proper, secured via their role in fish-seed production.
- Both BRAC and Proshika have gone a step further by creating entirely new and more mobile roles for women as para-vets and roadside caretakers, and have promoted women's mobility more generally through the training courses that participants in all activities attend. The continuing structures of groups and federal bodies, and the long term relationships which both NGOs build with their memberships, have played a critical part in making this possible against a background of resistance from more conservative elements in rural society.
- SPPSP has gone further still in attempting to bring a minority of women into groups formed to promote improved paddy cultivation practices. But here it was found that, although they attended the school regularly, none of those taking part have subsequently applied much of what they learnt. In part, this seems to be because most of them came from marginal households that have to rely mainly

on non-crop based activities for their livelihoods. At the same time, it was found that men from slightly higher status households, of the type best placed to respond to the practices advocated, were generally unwilling for female household members to participate in mixed gender schools. But more importantly, the fact that most of the suggested practices related to activities which women would not normally carry out, made them less receptive than their male counterparts. All of this demonstrates the difficulty of “adding on” women to activities primarily designed with men in mind, and of expecting them to take on non-traditional roles in the absence of any continuing institutional support.

## 6.2.2 The impact on gender relations

Where women have been able to participate, this had a number of practical implications, some of which carry wider potential to transform their status.

- Their pool of knowledge (ie the distinctly female sub-set of human capital) has been enhanced through their direct involvement in training and learning activities, through more informal contacts with technical staff, and through learning at second hand from male family members and each other.
- They have been affected as consumers, sharing in the nutritional benefits consequent upon the increases in rice, vegetables and poultry products arising from the various interventions. Similarly, the greater availability of tree products under Proshika has reduced the time which needs to be devoted to the collection of a given amount of fuel and fodder, creating additional opportunities for other activities to be undertaken, or for existing activities to be expanded.
- In all of the NGO cases, women have been able to increase the direct material and the financial contribution made to their households, and especially to their children. The sums generated have normally been insufficient to contribute significantly to the accumulation of physical capital, but instances were encountered with BRAC where proceeds were used to embark upon new more advanced forms of rearing, or where other types of family enterprise had been supported. With Proshika, women’s rights to the trees in the roadside plantation will ultimately place a larger sum of money in their hands than most will ever previously have commanded, which, in turn, should open up a range of new possibilities.
- Greater earning power has often also contributed to increased financial autonomy seen, for example, in being able to buy their own saris, and to women enjoying a greater say in the management of their family finances. This was a clear consequence of the HKI pilot vegetable production initiative. It is also very evident with BRAC, and to a lesser extent with CARE-IF. Status, both within the immediate family circle and with in-laws is correspondingly enhanced in these instances.
- A similar effect can arise as a result of the opportunities afforded via training and related activities for many women to associate with qualified people from outside their immediate family circle for the first time, thus effectively starting to build their own external social capital.
- In addition, by becoming poultry workers (in BRAC) or group leaders (in Proshika) women have been able to take on wider community roles for the first time, whose views are sought on technical issues and other more general matters.

All of these advances can come at some cost. Only rarely does it appear that the expansion of an existing activity or the taking on of a new one, is accompanied by a corresponding reduction in time input elsewhere. Sometimes a part of the burden may be re-distributed within the immediate family circle. But the capacity to do so,

which might for example, be denied to a young wife with small children to care for, may be a critical factor in determining whether a new opportunity can be grasped or not. But more often, it seems women simply work more intensively than before and cut back on such leisure time as they might previously have had.

Some BRAC poultry workers report, however, that male family members have begun to take on poultry related or more general domestic tasks, including cooking and child care, in order to make it possible for them to travel around and carry out their work. The same has sometimes happened with rearers as well. Whilst poultry related activities may not perhaps taking women very much further into conventionally defined male territory, it therefore shows more strategic transformatory potential in its capacity to modify established forms of male behaviour.

## **7. TAKING STOCK**

The final section of the paper takes stock of what has been learnt from the research, and identifies a number of critical gaps where additional investigation may be required.

### **7.1 Gaps**

The gaps emerging from the research will be dealt with first. Three stand out.

#### **7.1.1 The sustainability of input supply**

The first concerns the sustainability of input supply and the implications this, in turn, holds for the sustainability of the activities that have been promoted more generally. The experience of the BRAC poultry programme (see *box 2*) will be instructive from this point of view.

It will be recalled that BRAC has sought, wherever possible, to create free-standing systems whereby one set of producers or service providers, that it has initially trained and supported, are then able to go on to supply inputs to other members/producers on a continuing basis. In practice this strategy has met with mixed success. The critical link whereby one set of rearers raise chicks from the age of one day to six weeks, before selling them on to the various categories of mature bird rearers, has generally worked very well. The sub-system under which certain mature bird rearers are trained to produce higher quality eggs that are then sold on to local mini-hatcheries, who in turn provide day old birds directly to chick rearers, has fared less well. The chicks produced in this way are often found to be of a rather poor quality, and although certain mini-hatcheries still survive, BRAC has now reverted to supplying chicks from its own larger scale hatcheries (or procuring from similar government or private sector sources). A similar situation has arisen with regard to the provision of the improved feed that HYV birds require. Initially, BRAC members were trained to perform this function, but again quality proved inadequate, leaving BRAC with no alternative to procuring and/or producing this critical input by itself.

The fact that BRAC has the capacity to enter the market as a major supplier, and to access key inputs from other industrial scale suppliers on behalf of its members, offers a kind of sustainability. At the other extreme, Proshika nursery operators appear to have acquired all of the skills required to identify good quality seeds from trees already found in areas close to their homes, and then to use them to grow seedlings of adequate quality for the full range of local markets. The same kind of

simple local level sustainability appears to have been attained in the re-production of fish seed under IF2.

Cases like TCTTIP, which is mainly promoting farm level seed multiplication for rice production, and NGNESP, which has sought to build farm and community capacity to supply a range of vegetable seeds, occupy an intermediate and potentially more problematic position. Both projects operate in a context where quality inputs have previously only been available through central government agencies or large scale private sector companies, and where supply has only been able to satisfy a small proportion of overall demand. And both, by contrast with BRAC, face a situation where they (or, in the case of NGNESP, the various partner agencies) are only in a position themselves to provide an alternative source for no more than three years. Both have therefore been obliged to try to transfer the necessary technology to the local level very quickly.

Whilst this appears to have been successful in the initial phase, questions remain about longer term sustainability, that could not be addressed within the present study. The period for which seed quality can be maintained at or close to farm level without further infusions of parent material from central sources is of critical importance. With NGNESP, the answer will differ from one type of vegetable to another and may suggest the need for a much narrower range of varieties to be promoted with certain partner agencies at least. With TCTTIP, the need to reach national scale in a short period has meant very low density coverage at local level and an accordingly high dependence upon effective secondary adoption of seed multiplication skills if widespread dissemination of the new technologies is to be attained. Whether in practise this has occurred is impossible to say on the basis of our own study.

#### 7.1.2 Ways of learning and alternative approaches to human capital development

A second and closely related area of uncertainty concerns the cost-effectiveness of different approaches to human capital development.

Although precise figures are difficult to arrive at, a clear division with regard to cost has been noted between activities spending about \$50 per participant (the DAE cases and Interfish2) and the remainder, where the average outlay would appear to be closer to \$10. We have also seen that all packages offer high short term up-take and retention, but as discussion in the previous points indicates, questions of longer term sustainability and of the extent and quality of replication of improved practices can be far more difficult to resolve.

The need for further research is indicated here, but although no firm conclusions can be offered it is at least possible to highlight some of the more specific issues that would need to be addressed.

- One, fairly obviously, would involve the trade-off between cost and retention i.e. the respective merits of relatively low-cost, higher drop-out options, as opposed to more expensive but higher retention and/or wider dissemination alternatives.
- A second would concern the way in which training approaches might be tailored according to the complexity and other key features of the ideas to be disseminated.
- A third would open up the more demanding area of cost-benefit asking, for example, whether the relatively high cost/low dissemination combination apparently characteristic of “IPM plus” packages can be justified in terms of the

enduring gains offered in terms of the rehabilitation and preservation of soil fertility.

- Finally, lying behind these immediate questions are wider issues of how people already acquire and transmit knowledge of different types, whether this differs by education, gender, or other variables, and how training packages, that often appear to be designed primarily in terms of the convenience of the provider, might be made more responsive to the needs of different constituencies.

All of this, in turn, may well have implications for questions of inter-agency learning and collaboration in the field of training provision.

### 7.1.3 Creating and utilising social capital

A final gap in understanding arises in relation to the way in which extension agencies draw upon and seek to develop social capital in conjunction with their attempts to build human capital.

In several instances, it has been observed that the local groups formed in order to deliver extension messages to producers disband as soon as the immediate intervention draws to a conclusion. This may not matter as far as the immediate absorption and application of ideas is concerned, but may have more serious implications in terms of the capacity to sustain and further develop practice among primary adopters or to achieve more widespread dissemination. The demise of local organisations may also make it difficult to sustain production in the longer run, where for example, collaboration to support marketing vegetables or other produce may be required.

This will generally be less of a problem with the national NGOs who, to a large extent, have been able to channel their extension packages through pre-established groups which will continue to function and maintain contact with the parent organisation once the immediate intervention has drawn to a close. The position with NGNESP, where many of the partner organisations will maintain the same kind of ongoing relationship with groups, may be similar.

In the other instances, where the type of long term ongoing support which seems to be required to build sustainable organisations cannot be provided, an alternative approach rooted more firmly in existing forms of interaction within a community might represent a better way forward. It is, for example, clear that all of the farmers working the land under the command of the same STW already must take a number of joint decisions about how they will cultivate, and such a group might therefore sometimes provide a good foundation for an intervention. Similarly, all villages already have networks of people who pool labour and engage in other forms of mutual assistance. And there are always opinion leaders to whom others look for a lead in the adoption of new ideas, with their own networks of contacts, around whom groups might also be built. Since these individuals will also often be drawn from the ranks of the better off, this may in turn have negative implications for strict targeting procedures – a point that is developed further below.

## **7.2 Taking stock: beneficiaries and comparative advantage in extension provision**

All of these issues will require further investigation before any firm hypotheses can be advanced for wider testing in relation to a possible sector wide approach to extension. In other respects, the patterns emerging from the cases investigated, especially with regard to the question of who is benefiting, seem more

straightforward. What follows look firstly at access by socio-economic class and then by gender.

### 7.2.1 Access by class and the implications for poverty reduction

The results presented in section 6 show clearly that it is only the national NGOs (and to a lesser extent NGNESP) that are able to engage directly and to a major degree with people who definitely fall below the poverty line. This capacity reflects their ability;

- to offer choices which are consistent with the available resources and risk taking capacity of the poor
- to provide credit giving access to new production possibilities
- to provide ongoing institutional support and technical back-up.

It is, however, the marginal who are the primary beneficiaries and even in these instances the scale the improvement arising - typically amount to a 10-15% increase in income - will only be sufficient to raise households above the poverty line in a minority of cases. The interventions have quite a significant effect in reducing seasonal vulnerability and a rather smaller influence on the capacity to withstand periodic shocks. But again the impact is incremental rather than dramatic, and not all households initially raised above the poverty line will have acquired sufficient additional resources to remain there. Whilst some opportunities are offered to the landless, who are predominantly very poor, these tend to either to be rather short term in nature or only to be available to small numbers of people. Some reduction in poverty does take place, in other words, but the effect is likely to be limited.

A few marginal households are able to access the arable land based interventions of the other agencies, but these are often not appropriate to their capital base, their capacity to take risks, or their wider livelihood strategies. If the marginal were to be recognised as distinct from the small farm households, with whom they and the landless are currently bundled together in official formulations such as the New Agricultural Extension Policy, then it is possible that more might be accomplished on their behalf. But given the small quantum of individual resources at their disposal, it would only be through a multi-sectoral approach offering options in cereal, vegetable, fruit, fish and livestock production that significant progress might be achieved. Experimental initiatives already being conducted along these lines are certainly welcome and to be encouraged. Offering such intensive support at the level of the individual household may, however, come at the expense of not being able to achieve very extensive coverage, and thus ultimately not prove very cost effective. The marginal are already, to an increasing degree, looking to options other than agricultural self-employment on their own land as a part of their wider livelihood strategies. It may well be that supporting them in these endeavours would prove a more effective way of reducing poverty in the longer term.

The picture with regard to the small farmers is quite different. Conventionally it has been assumed:

- a) that the far greater land area under the control of large and marginal farmers means that they must inevitably produce the great bulk of the food the nation requires;
- b) that extension for the small is hence primarily driven by the imperative of alleviating their own poverty, and that their extension needs are distinct from larger farmers.

The picture emerging from this study is somewhat different, suggesting that:

- a) small farmers are able to adopt the same extension packages as their larger counterparts,
- b) they do so with greater enthusiasm in greater relative numbers
- c) they are now in the process of becoming the mainstay of national food production.

Because of this, some of those who previously fell marginally below the poverty line will now have been able to move above it, with reasonable prospects of remaining there in the future. At the same time, the vulnerability of those a little way above the line to future shocks will have been significantly diminished. From this it would seem there is no particular need for the small to be targeted in future.

Where, on the other hand, it may be useful to continue to distinguish the small farmers from their large and medium counterparts is in the existing and potential capacity of the latter as sources of employment to the very poor. Ideally those from within these groups who retain a direct interest in agricultural production can be supported in developing more of the types of small enterprises which have been noted here. And at the very least, all the extension initiatives in which they are involved should be screened for their potential labour creating and displacing effects. For it is here, at least as much as through the direct engagement of the poor, that the effects of extension on poverty are likely to be felt.

### 7.2.2 Involving women

The position with regard to women's participation is in many respects quite similar to that of the poor. Because the national NGOs can offer diverse forms of support and a continuing presence, they are better placed to address the multiple disadvantages by which women in general, and poor women in particular, are confronted. They are also best placed in terms of their capacity to accompany women as they explore new roles and begin to re-define the boundaries of the gender division of labour, although the international NGOs can also play an important part in the initial identification of new opportunities. Where government agencies, by contrast, try to "add on" women to conventional male focussed programmes without the type of wider support that NGOs can provide, little is in practice likely to be accomplished.

There is also considerable potential for strengthening women in their established roles and for making significant practical improvements in their lives, that all extension providers can successfully exploit. And where these roles are used as the point of entry, changes of a more strategic nature, such as the wider engagement of women in markets, their enhanced role in household decision making, or the sharing of the domestic workload by men, may all become possible as second order consequences.

But although extension is opening up new possibilities for women, this is taking place within a wider context where most services continue to be heavily male oriented and dominated. This makes it especially important that attention should be paid not only to engaging women more actively, but also to how their interests as producers and consumers may be more indirectly affected by the wider spread of work that is going on.

### 7.3 The limitations and potential applications of the study

In concluding, it is important to recall the limited nature of the empirical base on which the ideas to be presented are constructed. Only six cases of extension

practise have been considered and each has only been investigated in an individual village (although with supporting data from secondary sources being used to the extent that this has been available). Most of the organisations considered engage in a range of other extension activities and the outcomes reported would no doubt have differed to some extent if, for example, BRAC's work in social forestry and Proshika's livestock activities had been considered, rather than the reverse, as was the case here. There are also many other organisations whose work might have been explored if more time had been available, with government livestock, forestry and fishery agencies and non-government bodies working with small and marginal farmers perhaps the most obvious omissions.

By the same token, it should be clear that if more villages had been included, covering more regions and a greater diversity of agro-ecological zones, then the results presented would, at least to some extent, again have differed. There are, for example, quite strong grounds for supposing that some of the difficulties encountered in the reported experiences of the TCTTIP and NGNESP projects were peculiar to the particular locations selected and not very representative of the wider national picture. Some of the remaining cases might, on the other hand, have appeared in a somewhat less positive light if alternative locations had been selected. SPPSP, for instance, reports rather lower general increases in income arising from its activities nationally than were encountered with the particular group that we considered. It is also necessary to recall that each of the activities was guided by a somewhat different set of objectives and cannot therefore reasonably be subjected to any very direct form of comparative assessment.

For all of these reasons, it is important to re-iterate that what has been attempted here is not in any sense an evaluation (although readers from the organisations concerned, and others beside, may understandably still be inclined to view it in these terms). Secondly, and again to repeat what was said at the outset, case studies of individual communities (or, as in the annexes which follow, of individual households), do not prove anything by themselves. They can, however, serve to generate hypotheses for wider consideration. And hopefully at least some of the ideas here, relating, for example, to the comparative advantage of various actors, can play a useful part in informing the more general debate on sector-wide approaches, and the future of agriculture extension more generally, that is to follow. Hopefully also, the pictures of individual livelihoods, of village life and of interventions at grass roots level that has been offered can provide a useful reference point against which the more general ideas which are to be developed as part of the wider process of policy development, can be tested.

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## ANNEXE. HOUSEHOLD LIVELIHOODS CASE STUDIES

The four household portraits presented here have been extracted from a wider set assembled in the course of preparing the six individual extension organisation case study papers. Each is drawn from the client group of a different provider and each represents a different socio-economic category, beginning with a middle farm household and then moving downwards in the hierarchy through the small, the marginal to the landless. A small selection of this nature cannot possibly hope to represent the diversity of livelihood strategies currently being pursued in the rural area. It is intended, rather, to provide a flavour of some of the more common approaches, and to show how these interact with and are affected by the opportunities provided by different agencies.

### 1. Abu Taled. A SPPSP group leader from a middle farm household

Shajahan is 70, and his wife, Rabeya Begum, is 55. They have four sons and six daughters, five of whom have already married and moved away. Two of the sons have also married, but remain in the family *bari*. The eldest, Abu Taled is 32 and has been educated to higher secondary certificate level. He is married to Umma Salme Begum, who is 26, and together they have a son and a daughter, both of whom have recently started primary school. The second son, Md. Abdul Hakim, is a university graduate. He is married to Umma Habiba Begum, but they do not yet have any children. Two further sons, aged 22 and 20, and one daughter, who is 16, have not yet completed their studies, and remain in the *bari* too. Shajahan was an only son, and has no siblings living nearby, although he does have some cousins in the village.

As a young man, Shajaha inherited 4 *bighas* (1.33 acres) from his father. By taking further land under tenancy agreements and by trading, he has been able to accumulate substantial capital, most of which have been used to purchase additional land. Including his homestead, he has built up a total holding of some 12 *bighas* (4.06 acres), in the process moving up from the small into the middle farmer category during a period when average land holdings have been in marked decline.

The family homestead stands a short distance from the main road and reflects the comfortable economic status of the household. It is some 30 decimals in area, with buildings on all four sides around a central compound. There are several rooms, some of which have brick walls and polished floors, and all of which have either tin or tiled roofs. The interiors are furnished with elaborately carved beds, chairs, settees and wardrobes, and contain a range of modern consumer goods including strip lighting, electric fans, stereo cassettes and a television. In the compound area there is a hand pump, a shed for the family's three cows, and space for its goat and hens. Outside there is a sizeable area where post harvest operations are carried out, and where a large haystack stands. This is where the meetings for the Farmer Field School took place.

Beside the *bari* is a 14 decimal homestead garden, where bamboo and various vegetables are grown. A short distance away the family has five small high land plots with a total area of 86 decimals, which are triple cropped with *boro*, *t.amon* and potatoes. One of these, measuring 14 decimals, was used for the FFS, and has been adapted to allow rice fish cultivation and dike cropping. Slightly further off, on medium high and lower land mainly lying close to the river, are another eight plots with a total area of 2.76 acres. These are again triple cropped, with *amon*, *boro*,

jute, water gourd and chillies grown in various rotations. All of the land is irrigated, using the household's own shallow tube well, and some water is sold to others in the area. Alongside its agricultural operations, the household has developed a linked series of crop trading, storage and transport activities, using a Honda truck which they own jointly with a relation who lives locally.

Shajahan still retains an interest in farming operations. He participates in decision making and sometimes supervises work on the land lying closest to the homestead. The main responsibility for this aspect of the household's interests has, however, now passed to Abu Taleb, the oldest son and leader of the FFS. He manages all the hired labour, carries out certain operations himself, and looks after the shallow tubewell, whilst Md. Abdul Hakim, the second son, has taken over the day to day running of the business interests. The two together take responsibility for all domestic marketing, and play their part, alongside other adult household members, in tending the cattle. Rabeya, their mother, manages the vegetable garden, oversees post-harvest operations and is responsible for seed selection and storage. She also looks after the goat and hens, cleans the cattle house, and gathers fuel. The two daughters-in-law help her with the vegetables post-harvest work. Together with Naznin, the remaining daughter, they also cook, clean, and wash clothes. A woman servant is retained to assist with all aspects of post harvest and domestic work.

Apart from the labour that it hires, the family does not rely, to any significant extent, on others to assist in its major livelihood activities. It is, however part of a fairly loose network of about fifteen households in the village, made up of cousins, in-laws, and neighbours, which come together to provide support for marriages and other ceremonies, and may be expected to help each in times of difficulty.

The situation over the last five years has been relatively stable. Previously a small area was rented in during *boro*, which has now been taken back by its owner, but the loss in production has been almost exactly counterbalanced by the change from *chandina* to BR28, coming in the wake of the FFS, which increased yields by 22%. The area under *amon* has remained constant and yields are again at the same level as they were five years ago, although a switch to BR30 has helped to compensate for a decline in the output of the previously cultivated BR11 which set in during the middle of the period. Returns to potatoes again remain at a similar level, although there have been marked fluctuations in the interim caused largely by crop failures elsewhere leading to sharp short term increases in price.

Pesticides have been eliminated in *boro*, saving 600 tk. an acre, and *amon* expenditure has reduced from 330 to 60 tk. The household was already meeting all of its own consumption rice requirements and selling more than half of its total output prior to SPPSP. In return for what, on average, is estimated as another hour's work each day, the new technologies have enabled it to marginally increase net income during a period when this might otherwise have fallen. Its position has therefore been strengthened, and its short to medium term capacity to continue accumulating additional capital, enhanced. The household was also one of only two to take up rice-fish culture. 750 tk. was invested in preparing the land, and 50 tk. worth of fingerlings purchased. In return, they have been able to harvest about 30kgs. of fish, with a total value of about 1500 tk., although all has been consumed. The fish have also helped to control pests such as the brown plant hopper and the case worm.

## 2. Rahim Box. A small farmer growing vegetables under NGNESP

Rahim Box is 55. He was educated to class seven. His wife, Zorina Khatun is 40, and was educated to class four. They share their *bari* with Rahim's widowed mother, Romis Begum, who is more than 70. They have three daughters and one son. The eldest daughter has already married, but her husband's family live close by in the village. The second and third daughters, Rubia Khatun (14), Rumi Khatun (11) and the son, Zobaer (8) are all still at school and live at home.

Rahim's father died when he was very young and he has no brothers and sisters, but his father had a younger brother, who lives in an adjoining *bari*, with his two sons, Rahim's cousins. Rahim and his cousins sometimes work without payment on each other's fields, and look after each other's cattle when the owner is temporarily absent from the village. They also make small interest free loans to each other in times of difficulty, provide mutual assistance during marriages and other family ceremonies, and help each out when somebody falls ill. The family enjoys similarly close links with their son-in-law's family and with Zorina's relations, who live in the same union. Labour is again exchanged, loans may be made from time to time, and after the major flood of 1998 his relatives gave Rahim seedlings to help him start cultivating again. In addition, the household is able to draw on wider, but looser networks in the village, a recent example being provided by the Union Parishad chairman, who advised about his daughter's wedding. Important religious events are observed with other village members, at which times people visit each other's homes and offer hospitality.

Rahim's family live on their own five decimal homestead. This is bounded on the first side by a path with a paddy field beyond, on the second by a vegetable plots, and the third and fourth by adjoining homesteads. An outer space contains a haystack; a small partitioned area with a handpump set in a concrete area which is used for washing clothes; and an open area where their cow and goats are tethered. In an adjoining part there is some bamboo; a few trees, including: mango, jackfruit, guava, coconut, betel nut, jujube and papaya; and some vegetables, including Indian spinach. The inner area is rectangular in shape, with rooms on three sides and a cattle shed on the fourth, all facing inwards onto a small central yard, where one or two trees are growing, and straw is left out to dry. Small platforms have been constructed along two sides, one of which houses a small cage where a few chickens are kept. Each is sheltered by straw structures extending inwards from the main roofs, on which fuel and plants are stored. All of the buildings have tin roofs and walls and mud floors. The interiors are subdivided by partition walls of bamboo matting, and sparsely furnished with beds, a table and a few chairs. There are bars at the windows, one or two calendars on the walls for decoration, and clothes have been hung above the beds to form simple canopies. Rahim's battered bicycle is propped against one of the walls. The *bari* has an electric connection which provides lighting in the evening.

Rahim's family own six small plots of land in the village In addition to their homestead. 30 decimals of high land are used to grow vegetables throughout the year, whilst 29 decimals of medium high land is double cropped with *boro* and *t.amon*. The household also has a 3 decimal pond, stocked with *rhui*, *khatla*, silver carp and *glas* carp. In addition to its own land, the household has 10 decimals for which Rahim paid 4000 tk. under a 10 year mortgage arrangement, with 2000 to be returned when the land is finally redeemed. Another 15 decimals has recently been taken in share crop. Both of these plots are double cropped with *boro* and *t.amon*. Together with the homestead, the total area owned is therefore 0.67 acres, and the total operated, 92 decimals, placing the household at the lower end of the small

farmer category. Other significant assets owned include a cow, some goats, and some poultry.

Rahim takes exclusive responsibility for the cultivation of field crops, including vegetables, and for the buying and selling of goods. With a little help from her mother-in-law, Zorina plants and tends trees, cultivates gourds and other vegetables around the homestead, and carries out all post-harvest operations, including the selection and storage of seeds. Rahim and Zorina take joint responsibility for looking after the cow and goats, whilst Zorina and Rubia look after the poultry. Zorina and Romis share the cooking, cleaning, washing clothes, child care and other domestic tasks, with some help from Rubia and Rumi. Together with Zobaer, Rumi also helps by carrying food to the fields and cutting grass for the cow.

Rahim hires in a small amount of labour for transplanting, weeding and harvesting his *amon* and *boro* crops, for which he pays an average of 50 tk./day plus food. The annual wage bill comes to about 1,700 tk. To this must be added 340 tk for fertiliser and 800 tk (equivalent to 25% of the crop) for *boro* irrigation. The yield in *amon* is 20 maunds, and in *boro* 22 maunds. Together this is just sufficient to meet the families needs. No paddy is sold, and other than under extreme conditions, such as were encountered during the major flood of 1998, none needs to be purchased. Rahim and Zorina do not work for other households. Leaving aside vegetables, the main source of income is fish from the pond, which currently yields about 1500 tk per year. Smaller amounts, which in total contribute about as much again, come from the sale of bamboo, milk, and eggs. This situation has not changed very much over the last five years, although modest increases in rice production have been achieved as a result of the CARE Interfish 2 project<sup>8</sup>.

The Helen Keller/RDA intervention has, however, had a major impact on vegetable cultivation, with significant wider implications for the household economy as a whole. In 1996, before work began, Rahim grew a rotation of brinjal with jute or chilli on one of his plots, and cultivated potatoes with onions and paddy seedlings on the other. At the same time, Zorina only grew a very small amount of bitter gourd on a pocket of land next to the house. The project increased their awareness of the nutritional value of vegetables, taught them more about preserving seeds, and improved both the availability of seed, and the timeliness of supply by promoting nurseries and facilitating greater circulation amongst ordinary villagers.

As a consequence, the household was able to start diversifying and intensifying its production. There was a partial setback in 1998, when insects damaged a part of the crop, but with help from relations, Rahim was able to quickly recover. This aside, each succeeding season has seen further progress. Four years after the intervention took place, the area under vegetables by the homestead has now been tripled to about 1.5 decimals, and the range produced has been extended to include Indian spinach and beans, as well as turmeric. On one of the field plots, cabbage, spinach, bitter gourd, potato, garlic and tomato are grown in *rabi*, followed by red amaranth, brinjal and Indian spinach in *kharif*. On the other, Rahim now cultivates sweet gourd, beans, bottle gourd and brinjal, followed by *palwal* and bitter gourd.

The homestead vegetables are consumed, together with about 15% of the field production. The remainder is sold for 5000 tk. After deducting the annual cost of hired labour (500 tk.), fertiliser (300 tk.) and irrigation (100 tk.), this still leaves about 4000 tk.; most of which represents a net addition to the household's income, compared with its pre-project situation. Whilst not sufficient to acquire major new

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<sup>8</sup> See Howes 2001(b), the third case study in this series.

assets, this is still highly significant in helping to meet vital expenditures including school fees and clothing. Where previously the household was barely surviving under normal conditions, was highly vulnerable to periodic shocks, and was forced to rely on rather fragile social safety nets, the project has helped it to attain a greater degree of security than it previously enjoyed.

### **3. Monowara, a BRAC chick rearer from a marginal household**

Monowara is a woman of about 40, who lives with her husband, Abdur Rahman and their three unmarried sons. They also have a daughter who has already married and moved away from the family home.

The family used to survive mainly from a piece of sharecropped land operated by her husband. This provided most of their rice requirement and an additional 500 tk. in income each year, and gave them the status of a marginal household. Two of the sons helped him and also brought in about 900 tk./year between them as labourers. Monowara had trained as a tailor but was not earning anything. Neither was her other son, who was still too young to make a contribution.

She began work as a chick rearer in 1998, supported by a BRAC loan of 8000 tk. 3200 of this was used to purchase chicks, and 3000 to buy feed; whilst 800tk was invested in a feeder/drinker, and 2x300tk in brooders, which help to maintain temperature at the correct level. The remaining 400 was retained as compulsory saving. She repaid at 200 tk./week for 46 weeks, with total interest charges amounting to 1200 tk. A further 1600tk of the households' own money was invested in constructing two rearing rooms.

At the time of our study, Monowara was rearing her tenth batch of chicks. She had therefore averaged three batches per year up until that point. With each batch lasting for a little more than two months, it should in principle have been possible to rear more, but she generally stopped during the rainy season when it was difficult to keep feed and litter dry, and mortality rates increased. Production had also been interrupted at one point when a rearing room needed repair, but the resources to carry out the work were not immediately available. Four batches per year were thought to be a reasonable target for the future.

Monowara did most of the rearing herself, typically devoting six hours a day to the task. This was divided into three two hour sessions, one before breakfast, one before lunch, and one in the evening. Her husband helped out from time to time, and her sons would often lend a hand during the morning, when she was busy cooking. Both her husband and sons also assisted with other domestic responsibilities like collecting water. With this support, and no longer having any small children to care for, she had more or less been able to manage by working more intensively than before, and had not had to cut back much on other activities.

The number of chicks reared at one time had ranged from 200-500, but 300 was normal of which, on average, 276 (92%) would survive. Each was purchased at 16tk and sold at 50 tk., giving a margin of 34tk./bird. With the loan repaid and the rearing facilities installed, annual expenses were confined to feed (about 20,000 tk.), vaccinations and medicine (1300 tk.) and electricity (9000 tk.), and left an annual profit in the region of 7000 tk.

Part of the money was fed directly back into her chick rearing, whilst the remainder had been used alongside two further loans raised from BRAC to establish additional family enterprises. The first, a peanut trading business operated by her husband

when he was not engaged in his continuing share cropping activities, was turning over 18,000 tk. a year and yielding a modest profit. The second, a vehicle repair shop opened by her elder sons, was making a similar amount. The younger son was also now old enough to work and earning 1000 tk./month as a bus conductor.

The overall financial position of the household was therefore now very much better than it had been three years before. Nearly all of the additional income had so far gone into building the new businesses, but the household was no longer forced, as it had been in the past, to take out loans to tide them through periods of difficulty. For the future they entertained ambitions to buy land, to improve their house, and to send one of the sons abroad to work.

Part of the improvement was clearly due to life-cycle factors, with formerly dependent or semi-dependent sons now able to make a financial contribution, whilst their parents still remained reasonably fit and active. But the initial opportunity BRAC had provided to Monowara, and the way in which this, in turn, had been used to leverage further financial support, had clearly also had a critical role to play.

#### **4. Lal Banu. A Landless Widow and Proshika Plantation Care Taker**

Lal Banu is a widow. She lives alone in a small tin walled and straw roof house built on one decimal of land. The plot was formerly passed on by her father-in-law and adjoins the homestead of a better off household for whom she sometimes works. She has two sons and two daughters who have married and moved away from the village. Her daughters visit her from time to time, but none of her children provide her with any material help, which she says is quite usual nowadays.

Before her husband died some five years ago, she did not work at all outside of her homestead. After his death, she began cutting earth on local construction projects to support herself. She was also able to earn a small amount from keeping poultry and selling vegetables which she grew around her homestead. After a time, the scheme on which she worked came to an end, and she then fell sick. In due course she made a partial recovery, but lacked the strength and energy to go back to the type of heavy work she was doing before.

She now depends mainly on working as a servant for a richer household as her primary means of support. Her duties include winnowing, parboiling, grinding spices, sweeping and washing clothes, for which she receives 20tk and two meals a day. This income is supplemented by gleaning paddy left in the fields after the crop is cut at harvest time, some of which she then sells directly, and some of which she uses to produce puffed rice. She also continues to raise chickens and grow a few vegetables.

Lal Banu's position as a single woman landless household could hardly have been more precarious, and NGOs have generally found it difficult to offer effective assistance to the very poor group of people to whom she belongs. Proshika has, however, been able to provide significant help. The major contribution has come in the form of two interest free loans, one for 2,500 and another for 500 tk, which have made it possible to repair her house and install a sanitary latrine. At the same time, the organisation provided her with a year's employment as one of the caretakers on the roadside plantation, for which she received 500 tk/month, and out of which she was able to repay her loans. As a result, her life is now at least a little easier than it would otherwise have been.