

Initiative for Mainstreaming Innovation (IMI)  
“Innovative forms of training and capacity-building in  
IFAD-supported projects and programmes”  
Policy and Technical Advisory Division

# Bangladesh

FIELD STUDY



Enabling poor rural people  
to overcome poverty

**International Fund for Agricultural Development**

**Initiative for Mainstreaming Innovation (IMI)**

**“Innovative forms of training and capacity-building  
in IFAD supported projects and programmes”**

**Bangladesh**

**This document contains two field studies:**

- 1. Evaluation of Training Provided by Projects**
- 2. Evaluation of Training in Mini-Hatchery Technology**

**Edward Mallorie, Nowsher Sarder**

**June 2011**

**International Fund for Agricultural Development**

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**Field Study**

**Bangladesh: Evaluation of Training Provided by Projects**

**Edward Mallorie, Nowsher Sarder**

**June 2011**

This paper was prepared by Edward Mallorie and Nowsher Sarder, IFAD consultants.

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# BANGLADESH

## Evaluation of Training Provided by Projects

### Contents

Acronyms .....	ii
IFAD-funded projects included in this study .....	iii
Objectives.....	1
Training in project design.....	1
Implementation of training.....	4
(a) Targeting .....	4
(b) Training providers.....	5
(c) Training management .....	6
(d) Training venues, duration and delivery .....	7
(e) Training follow-up.....	9
(f) Cost of training .....	10
Outcomes and impact of training .....	11
(a) Training of beneficiaries .....	11
(b) Training of local level service providers .....	15
(c) Training of staff .....	16
(d) Findings of Knowledge, Attitude, Practice surveys .....	17
Conclusions and recommendations.....	17
Bibliography .....	19
Annex 1: Results of a study on the effectiveness of training.....	21
Annex 2: Findings of Knowledge, Attitude, Practice surveys.....	31

## Acronyms

AWPB	Annual Workplan and Budget
BARD	Bangladesh Academy for Rural Development
BARI	Bangladesh Agricultural Research Institute
BIRRI	Bangladesh Rice Research Institute
CDF	Credit and Development Forum
DAE	Department of Agricultural Extension
DoF	Department of Fisheries
DLS	Department of Livestock Services
GO	Government Organisation
IGA	Income Generating Activity
KAP	Knowledge, Attitude, Practice (survey)
KS	Krishi Sampadoks
LGED	Local Government Engineering Department
LTA	Livestock Technical Assistant
GTI	Graduate Training Institute
MTR	Mid-Term Review
NGO	Non-Governmental Organisation
PAG	Pond Aquaculture Group
PCR	Project Completion Review
PKSF	Palli Karma-Sahayak Foundation (apex organisation for micro-credit lending)
PMU	Project Management Unit
RDA	Rural Development Academy

## IFAD-funded projects included in this study

<b>Abbreviation</b>	<b>Name of project</b>	<b>Dates</b> (effectiveness-closing)	<b>Lead agency</b>
NIAPWMP	Netrakona Integrated Agricultural Production and Water Management Project	July 1994 – June 2001	DAE
ADIP	Agricultural Development and Intensification Project	Dec 1997 - Dec 2004	DAE
SAIP	Smallholder Agricultural Improvement Project	March 2000 - Dec 2007	DAE
AqDP	Aquaculture Development Project	Dec 1998 - Dec 2006	DoF
SCBRMP	Sunamganj Community Based Resource Management Project	Jan 2003 – Dec 2014	LGED
MFTSP	Micro-Finance and Technical Support Project	Oct 2003 – June 2011	PKSF
MFMSFP	Micro-Finance for Marginal and Small Farmers Project	June 2005 – Dec 2011	PKSF
MIDPCR	Market Infrastructure Development Project in Charland Regions	Sept 2006 – March 2014	LGED
FEDEC	Finance for Enterprise Development and Employment Creation Project	Jan 2008 – Sept 2014	PKSF

## Objectives

This study has been commissioned as part of IFAD's Initiative for Mainstreaming Innovation (IMI)<sup>1</sup>. Training is one of the primary means to build the capacity of poor people to participate and fully benefit from mainstream economic development. IFAD places great emphasis on capacity-building and training which are fundamental to the success of development interventions, from agriculture and infrastructure to rural finance and gender equality. Training and capacity-building activities represent an important component in IFAD supported activities and absorb up to 30 per cent of resources in some projects.

The specific objective of this study is to learn lessons from IFAD experience in Bangladesh regarding training and capacity building, and so to improve the effectiveness of training for social development, capacity building, technology dissemination and innovation. The study has been conducted in two parts. This report includes an analysis of training information and data, including feedback from project staff, from four closed projects and five on-going projects (one of which has just been completed). The draft report benefited from detailed comments from Training Specialists in two projects (Mr Jahangir Kabir of MIDPCR<sup>2</sup> and Mr Md. Shahidullah of SCBRMP), and from Maria Hartl of IFAD's Technical Division and Frands Dolberg, a Livestock Consultant. A second report contains a detailed case study of training on one topic, mini-hatcheries, for one of these projects, the Micro-Finance and Technical Support Project.

## Training in project design

Training is an important element in the design of all nine IFAD projects. Basic information on these projects, including full project names, are shown in the table that follows the glossary and abbreviations. Table 1 below shows that these projects have provided over two million training places for beneficiaries and project staff.

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<sup>1</sup> The Initiative for Mainstreaming Innovation is a three-year initiative to enhance IFAD's capacity to promote innovations that will have a positive impact on rural poverty.

<sup>2</sup> Acronyms of project names are used throughout this report. Full names are shown in the table on page iii.



**Table 1: Training in IFAD projects**

Project	NIAPWMP	ADIP	AqDP	SAIP	SCBRMP	MFTSP	MFMSFP	MIDPCR	FEDEC	Total
Status	Closed	Closed	Closed	Closed	On-going	Completed	On-going	On-going	On-going	
Total expenditure on training Tk.m.	2.34	47.82	41.81	115.79	52.98	85.17	37.78	43.86	1.68	429.23
Training as % of total cost										
in project budget	11%	7%	10%	15%	4%	10%	3%	4%	4%	
actual expenditure	11%	8%	10%	17%	4%	4%	2%	4%	0%	
Actual training as % of budgeted	81%	100%	100%	104%	59%	50%	63%	37%	1%	
No. of direct project participants										
Appraisal		120,000	24,020	130,700	90,000	276,000	210,000	119,495	117,700	1,087,915
Revised		115,270	47,475					86,750		
Actual		109,200	49,144	100,500	85,051	234,750	178,047	64,580	135,688	956,960
Number of training places										
Appraisal										
Beneficiary		8,000	12,585	16,240	169,160	785,800	1,092,000	320,605	3,700	2,428,090
Staff		4,667	3,075	3,690	277	1,380	7,960	1,115	2,850	25,014
Revised										
Beneficiary		61,908	45,983	41,046						
Staff		17,900	3,850	14,143						
Actual										
Beneficiary	82,500	173,457	177,388	324,748	170,598	271,597	617,363	166,178	1,420	1,985,249
Staff	3,694	14,128	676	43,050	706	3,781	3,988		2,027	72,050

Project designs usually (NIAPWMP may have been an exception) set targets in terms of training places to be provided (this is often described as the number of people to be trained, but individuals may well be trained more than once). However the actual numbers trained differ considerably from the physical targets set in project design, being either greatly more or greatly less. This suggests that design targets have been unrealistic and inadequate care has been given to training in project design.

In terms of numbers to be trained, the closed projects of ADIP, SAIP and AqDP set very modest targets<sup>3</sup>, which were later revised upwards, but even these revised targets were exceeded. The actual numbers trained in these projects was between 11 and 18 times more than appraisal targets. There was only a modest increase, at most, in training budgets, and it seems that project design greatly over-estimated the unit cost of training. In ADIP unit costs of training were reduced by the use of short, village-based, courses.

Of the on-going projects, SCBRMP has met its target of training numbers with 4 years remaining out of its 14 year implementation period, so it will exceed its targets by a modest amount. The more recent project of MFTSP, MFMSFP, MIDPCR and FEDEC are

<sup>3</sup> The appraisal report for ADIP proposed that only one farmer be trained in each group who would then pass on information to other group members. This "lead farmer" approach was originally part of the training and visit system of agricultural extension, but had been abandoned by the time ADIP was implemented in favour of a group approach.

unlikely to meet their training targets. These projects were planned using the experience of earlier projects and assumed that low-cost training could be mass-produced. MFTSP has been implemented by PKSF (Palli Karma-Sahayak Foundation) and its management found that it was impossible for the small PMU (project management unit), with a total of only five technical and management staff, to supervise the planned volume of field training carried out by 24 implementing NGOs. With the agreement of IFAD supervision missions, the project focused on ensuring the quality of a smaller volume of training, and it will end up training about half the numbers anticipated at appraisal.

MFMSFP, another project being implemented by PKSF though its partner NGOs, is also unlikely to reach its physical training targets, maybe by around 30 per cent. In particular the Department of Agricultural Extension (DAE) has not been able to deliver the planned volume of training due to pressure of work on its district and upazila (sub-district) level staff from other projects and priority activities. The most recent of these projects, FEDEC, has just passed its mid-point, and is on course in terms of staff training, but has done little in terms of beneficiary training as the project first focused on training of staff, and is now trying to get its partner NGOs to think beyond the supply driven short courses that have traditionally been the pattern of beneficiary training<sup>4</sup>.

The only project design mission to include a training specialist was that for MIDPCR. A comprehensive training plan was included as Annex 8 to the project design document. This includes: (i) a matrix showing, for each course, the objectives, participants, duration, trainer, number of events, venue and organising agency; (ii) a detailed cost breakdown for each course; (iii) course planning sheets showing objectives and course contents; and (iv) monitoring forms including training records, evaluation forms and a questionnaire for Knowledge Attitude Practice (KAP) surveys. The design document of FEDEC included a training needs analysis focusing on training of staff of partner NGOs and PKSF. Most other design documents specified training in terms of broad subject matter (e.g. crops, livestock), number of course batches, size of batch, duration, venue (in terms of field or classroom), trainer and cost. In practice projects have deviated significantly from these plans. For example, the SCBRMP Appraisal Report listed 31 different types of training to be provided to beneficiaries and staff. Of these, five have been dropped and 15 substantial revised, with another 18 training courses added during project implementation.

Although project design could plan in training in greater detail, this may not be particularly useful. The Training Specialist in the MIDPCR PMU says that the detailed training plans have not been useful and he has drawn up detailed training modules for training of market stakeholders – but is not so much involved in training in the components of the project that are the responsibility of DAE and NGOs. For MIDPCR

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<sup>4</sup> Following a recommendation of the MTR (Mid-Term Review), FEDEC hopes to develop practical “apprenticeship” type training.

NGOs have prepared their own training modules, based on those from other projects that they are involved in, while DAE prepared their own training modules. In other projects, training modules have usually been prepared by the project training specialists. PKSf projects have distributed training manuals to project partner NGOs.

Without a detailed training plan, most training has been “demand driven”. However projects have not adopted a formal process to determine exactly what training is demanded – attempts to do this via “farmer information needs assessment” in SAIP was not successful as DAE field staff lacked the ability (and maybe motivation) to carry out this process, even though it was part of mainstream approach for agricultural extension. In practice local project staff may select topics for training – but this can result in a very wide range of subjects and a lack of focus. For example MFMSFP reported training in 64 different crop subjects and 19 livestock subjects, while SAIP reported one day training for group members in 49 different topics and staff training in 25 different topics.

## **Implementation of training**

### **(a) Targeting**

The vast majority of project group members are women. As a result most training has been delivered to women. In many situations this has had a positive outcome – women being often overlooked and ignored by technical service providers. The acquisition of technical knowledge and skills has empowered women, especially when combined with access to micro-credit. Although livestock and homestead vegetables are traditionally women’s activities, field crops tend to be at least managed by men, although increasingly women work in fields. A number of supervision missions have raised concerns that crop training given to women has not been applied by their husbands, and there has been a move by projects such as MIDPCR and MFMSFP to provide training to the husbands of women members. Although not part of the original project design, AqDP only gave training in pond aquaculture to women. This appeared to provide women with considerable empowerment, with them taking control of household ponds, and utilising project credit alongside their new skills.

Projects also have poverty targeting criteria, with projects focused on the functionally landless (owning under 0.5 acres) and/or small and marginal farmers (owning under 2.5 acres). Although participation in project groups may adhere to these targets, the recent Mid-Term Review (MTR) of MIDPCR got the impression that much training was reaching the less poor members of project groups – possibly because they have the resources to respond to the opportunities offered by training.

## **(b) Training providers**

Training provided by projects varies from vocational courses lasting some months to brief half-day sessions in the village. Instructors (facilitators) for training courses are usually project staff (including those of project partner NGOs) or staff of government technical line agencies (agriculture, livestock, fisheries) who have been contracted as individuals to provide training. Despite encouragement from recent supervision mission, projects have made little use of successful farmers as trainers – with the notable exception of training for mini-hatchery operators in MFTSP. Some training has also been contracted to external institutions – see examples in Table 2. In MFTSP most training of group members was carried out by the project partner NGOs responsible for forming these groups and providing them with micro-finance. However, to improve training quality, the PKSF PMU contracted a number of key courses to selected NGOs with a proven capacity, who then trained group members from all project NGOs. While these NGOs were mostly the more capable project partners, dairy training was contracted to a non-project NGO.

MFMSFP planned to contract all training in crops to DAE, with project partner NGOs providing non-crop training (such as livestock). However it was found to be difficult to get a firm agreement with DAE at a local level – DAE officers being pre-occupied with other work. This training has therefore been provided by project partner NGOs – although these NGOs often hire individual DAE staff members as instructors.

Projects can involve key people as trainers or trainees in order to enlist their support for changes in processes and practices. For example, MIDPCR has suggested that using Upazila Nirabahi Officers to provide training on market management can help enlist their cooperation, as head of government for the upazila, in the transfer of maintenance funds to Market Management Committees. Training of LGED Upazila Engineers and the senior staff of other government departments can explain the approaches adopted by the project and help build their support.

**Table 2: External training providers in IFAD projects**

Type of training	Persons trained	Training providers	Projects	Comments
Agriculture	Project staff	BRRRI, BARI, BAU, BARD, GTI	NIAPWMP, SAIP, ADIP, SCBRMP	5 to 15 days
Irrigation, seed technology	Project staff	RDA Bogra	MFMSFP, NIAPWMP	
Project management	Project staff	BARD Comila	MFTSP, MFMSFP, SCBRMP, NIAPWMP	7-14 days
Dairy farming	Beneficiaries	PPD (NGO)	MFTSP	Residential course Practical training 10 days
Mini-hatchery, Model Breeders	Beneficiaries	DLS duck farm, Narayanganj Various NGOs	MFTSP	30 day duration NGOs used farmer-trainers
Poultry vaccinators	Beneficiaries	Various NGOs	MFTSP	
Livestock/Agricultural Technical Assistants	Project staff	Ministry of Youth, Veterinary Training Institute	MFTSP, MFMSFP	1 month initial training, 7 day refresher training
Introduction to micro-finance	Project Staff	CDF	MIDPCR	

In some projects additional training has been provided using IFAD resources. This includes a gender mainstreaming workshop for MIDPCR, the IFAD grant funded SCOPE (Strengthening Capacities of Organizations of the Poor) project which provided training for SCBRMP, and training of senior staff and trainers in micro-enterprise lending and value chain development by a senior IFAD consultant for FEDEC. The consultant also developed a number of training modules. Such support can allow higher calibre and more expensive trainers to be used, and has had a particular impact at FEDEC.

### (c) Training management

Most projects have employed training specialists, although in some projects this has been combined with advising on agricultural extension. These specialists are employed to manage project training processes – including planning and quality assurance.

**Table 3: Training Specialists**

Project	Number of training specialists		Comments
	PMU	Field offices	
NIAPWMP	1*		
ADIP	1*		
SAIP	1*		
AqDP	1*		
SCBRMP	1	8	Training Specialists in field offices are being phased out.
MFTSP	2		
MFMSFP	1		
MIDPCR	1		
FEDEC	1		Training specialist also covers other projects

\* training and extension specialists.

Training Specialists and other project management staff report that the organisation of training courses to meet annual training targets has kept them very busy and there has been little time to outsource training to external agencies, recruit farmer-trainers, or to monitor the quality and outcomes of training. The Training Specialist for MIDPCR has suggested that partner agencies (DAE and NGOs) should have their own training units or cells. With little out-sourcing, most training has been carried out by project staff or by staff of the technical line agencies (such as DAE) and partner NGOs. Line agency (and possibly NGO) staff are paid honorariums for providing training and so are usually willing to do this work.

Some projects found it difficult to accurately record and report on the numbers of people trained. Reasons for inaccurate reporting include an unwillingness to admit to exceeding targets for numbers trained, assuming that each batch has a standard number of trainees, and overlapping (or gaps) in reporting by different project units. Training certificates have only been given out for a few courses – although much appreciated by trainees, they add further to the burden of overstretched training staff.

It has not been possible to track the number of individual project participants who have received training as against the number of places on training courses. Although the number of training places may exceed the number of project participants, some participants may be trained a number of times, while others get no training. A sample survey of the impact of ADIP confirmed the total amount of training carried out by DAE (an average of 1.72 courses per group member), but a significant number of respondents (23 per cent reported getting no training while some got trained up to six times.

The impact survey for AqDP found that on average, each pond aquaculture group (PAG) member had received 2.2 training sessions, but 21 per cent of members had received no training at all. This is at variance with the project data showing that, on average, each group member received 3.5 training sessions. Some of this difference can be attributed to members only joining groups after training programmes have been completed, while members who have had training left. It is also possible that survey respondents did not recall all training courses attended (suggesting they were of poor quality) and also over reporting of numbers trained by the project. The PCR concluded that provision of training in AqDP suffered from: (i) being squeezed into the last four years of the project; and (ii) lack of supervision and good quality technical support from the Project Implementation Unit.

#### **(d) Training venues, duration and delivery**

Training venues include the training institutes, project offices, field offices of partner NGOs, classrooms in local schools, and open spaces in villages. Training in the village has the advantage of possible access to fields, fishponds and animals to see the application in practice. However some trainees, particularly women, say that they get

distracted by life going on around them. Other trainees prefer a village location – saying it takes less time to get to the venue. In participatory ranking by project group members carried out for the Project Completion Review of ADIP, training in the village was consistently rated more highly than training at the local town. A study of training in SAIP also reported that people prefer training venues to be close to where they live (see Annex 1).

The vast majority of training has been non-residential, although some residential courses have been provided using the facilities of training providers such as RDA, BARD (rural development training academies), BARI and BRRI (agricultural research institutes), and at NGO training centres.

Overall, most training courses have only been for one day or half a day. The actual period of instruction is often less than that planned, due to the need for instructors to travel to field venues. Staff from line agencies, particularly DAE, can find it difficult to find time out from other activities. Although trainees often say that the duration of training has been too short, male farmers can say that they cannot take the time out for longer training. If trainees are motivated by cash training allowances, then the shorter the time that needs to be spent, the better. The opinion of some project staff is that week-long training courses are better than one-day courses and, even if the higher costs mean fewer people will be covered, the overall outcome will be better. However it is also apparent from a recent 15 day residential training course for farmers organised by MFMSFP, that around half of all trainees are not real farmers, but rather people who have time available to attend a 15 day training course. The same is apparent from the study of mini-hatchery training, with only around half of trainees attending 30 day training courses actually taking up the technology, while many of those who start mini-hatcheries without going on training courses, say that they did not have time to attend the training.

A study on the impact of demonstrations and training for ADIP (reported in the IFAD PCR) found that 43 per cent of sample group members thought that the duration of courses were too short. Most agricultural training for SAIP consisted of one day training, mostly conducted by DAE staff (which trainees often thought was too short – see Annex 1). A total of 317,861 places were provided on such courses. A much smaller amount of farmer training (6,887 places) was one to three week residential training, mostly at district horticultural development centers, and at BARI, BRRI, BAU and GTI. A project study showed that the adoption of knowledge was higher with residential training than one day training.

Although all projects have made use of training aids, primarily flip charts, review missions often comment on the need for more and better quality training aids – as do some feedback surveys from farmers (such as that summarised in Annex 1). Most training is lecture based – and more practical instruction, as has been the case for dairy

farming and mini-hatchery training at MFTSP, is very much more effective – although more expensive and more difficult to arrange.

The 2009 supervision mission for MFMSFP said much farmer training continued to consist of general instructions in crop husbandry that are well known to most farmers. To a large extent this was attributed to the continued dependence on DAE staff to provide the bulk of farmer training as DAE only can provide limited resources for such training. The repetition of general instructions was also due to the fact that there is difficult for POs to assess farmers training needs. The next supervision mission reported that POs were reducing their dependence on DAE for training, but it was difficult to find alternate trainers (such as people from research agencies and private sector companies), and NGOs are using their own staff.

In an effort to meet training targets in MIDPCR, DAE was found to have merged training batches into groups of up to 60 trainees and also reduced the duration of one day training. This has affected quality, although the recent MTR noted that DAE had now improved the management of its training and quality had significantly improved. There were also concerns that the contents of livestock training carried out by NGOs was too complex, with too many messages, not all of which were relevant to poor women with little education (such as advanced breeds used by commercial farmers). Training in MIDPCR (and also other projects) is based around training manuals which tend to cover all the technical information required for the enterprise rather than being more selective in terms of telling farmers what they actually need to know to adopt a new practice or technology. The use of these training manuals aims to ensure a minimum standard of instruction, without actually knowing who will deliver the training or the training needs of the target group.

### **(e) Training follow-up**

It is apparent from a number of projects that a key factor in the adoption of knowledge and skills disseminated by training is post-training follow-up. In ADIP and SAIP this was provided by DAE junior level field staff – the Block Supervisor. Project group members reported they really appreciated getting to know the Block Supervisor. Similar support from Block Supervisors (now re-designated Sub-Assistant Agricultural Officers) was planned for MFMSFP, however the linkage envisaged with DAE did not materialise and project partner NGOs have now recruited an Assistant Technical Officer for each branch office to provide this support.

In MFTSP follow-up has been provided by Livestock Technical Assistants (LTA) and, as shown in the mini-hatchery study, it is possible for LTAs to transfer knowledge and build skills through direct contact with livestock producers, without the need for a formal training course – although it is not known if training can reduce the amount of direct contact needed, and so still be cost-effective. A similar experience exists in MFMSFP, where the “Maria Model” (a system for on-farm paddy seed selection and



storage<sup>5</sup>) was disseminated by project staff via informal group meetings (primarily held for micro-finance transactions) rather than via formal training courses.

### (f) Cost of training

**Table 4: Examples of cost of training in IFAD projects**  
(Tk<sup>6</sup> per person)

Item of cost (for one day of training)	MIDPCR		MFMSFP	
	GO	NGO	GO	NGO
Venue Charge	0	0	0	0
Resource speaker allowance	75	8	17	12
Trainees allowance/transport	100	27	50	50
Training materials (pen/paper)	30			
Food (lunch/snacks etc)	30	15	20	0
Other	25	0	200	0
All	260	50	287	62

Table 4 compares the unit cost of one day of training in some recent projects. It shows that that, on the whole, training is cheaper if provided via NGOs (which is primarily for projects implemented by PKSf) than by government agencies. NGOs generally pay lower training allowances, while if NGO staff provide training, any additional allowances that they are paid are lower than those of government agencies. However MFMSFP found that paying farmers a training allowance of only Tk10 per session was too low – especially if trainees incur transport expenses, and it was increased to Tk50. It should also be noted that neither NGO nor government agency training can be considered to be expensive. However differences in allowances paid to both trainees and trainers/resource persons between projects being implemented by the same agency can create constraints with people less willing to implement training where allowances are relatively low, and leading to demands for training rates to be revised upwards<sup>7</sup>.

Projects have not levied any charges for training on trainees. The type of training is generally of “public good” type – in other words it provides information that farmers may well obtain from other farmers and via other media, rather than being of the vocational and skill development “private good” training, for which people might pay fees. Such vocational training includes tailoring and training for work in garment factories, as well as training that leads to qualifications such as nursing. Where projects have provided vocational training (such as for para-vets), no charges have been made as

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<sup>5</sup> Maria is a village in Bogra District and the Maria Model involves using salt water to separate good seeds from bad, drying them and then storage in an airtight container along with a neem leaf as a pesticide.

<sup>6</sup> 1 US\$ = 71 Tk.

<sup>7</sup> This is an issue for training provided by DAE in MIDPCR. More recent projects being implemented by DAE are paying higher allowances.

it has been felt that any fee would discourage people from taking the training and going on to provide a service (such as animal health)<sup>8</sup>. However in FEDEC NGOs are contributing to the cost of training their staff in micro-enterprise lending. NGOs have found that such lending is profitable and can allow them to expand, and such cost-sharing has enabled a larger number of staff to be trained.

## **Outcomes and impact of training**

### **(a) Training of beneficiaries**

Training is reported to have had positive outcomes in terms of transferring knowledge, building skills and improving livelihoods.

The impact study for NIAPWMP (reported in the IFAD Project Completion Review) found that, out of a sample of 284 farmers, 62 per cent had poor knowledge prior to training, 92 per cent said they developed skills as a result of training, 73 per cent applied this skill and knowledge, but 80 per cent said they needed more training on the same subject.

A study on the impact of demonstrations and training for ADIP (reported in the IFAD Project Completion Review) reported that 42 per cent of sample members said they had gained much knowledge, 33 per cent said they only gained some, and 25 per cent only a little new knowledge. However two-thirds said that they had applied the training on their farms. Agricultural extension services provided by DAE in this project were appreciated by group members. Prior to the project they often had no contact with DAE or any other service provider. Although farmers often got information from other farmers, most women group members had very little technical knowledge. Building a link between DAE and relatively poor and disadvantaged farmers has been an important achievement of the project. This partly came about through the training programme implemented by DAE. Although 80 per cent of group members were growing and selling fruit and vegetables (Impact Survey), the project seemed to have been less successful in terms of the large-scale dissemination of new technologies. However there were cases of adoption of new technologies – with new types of vegetables, such as carrot, being grown, and support for other new crops came from contact with the Block Supervisor (BS), the village level field staff of DAE, rather than from specific training and demonstrations provided by the project. Training on poultry has resulted in many groups now getting all their poultry vaccinated – which they see as a major step forward.

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<sup>8</sup> Moreover vocational training provided by projects has not been linked to recognised qualifications – such training for recognised qualifications requires more time and is more costly training than that provided by projects.

*“We did not know BS before, never we visited agriculture office (DAE upazila level office). We did not know that we could get help/advice from this office. Now we even know many other offices (DLS, BADC, NGO offices) and can seek services from them.”* an ADIP beneficiary

A study on the effectiveness of training was commissioned by SAIP and its findings are summarised in Annex 1. The survey found that 26 per cent of respondents reported that they had fully adopted the technology with another 27 per cent were found to be partially practicing the technology. In general there was more adoption for profitable crops such as tomatoes and onions, while community-based activities for rice seedbeds, vegetable nurseries and compost were generally not taken up by farmers. Ease of management of the technology and availability of markets also encouraged adoption, while lack of suitable land and high labour requirements discouraged adoption.

Training in pond fish culture can be quite successful. Although such training in ADIP was often provided to people who had no ponds, pond fish culture was a major focus of the AqDP and pond group members interviewed by the PCR mission had a good understanding of the principals of pond fish production (pond preparation, liming, stocking etc.), although some said that would like more training on subjects such as nursery ponds. This training was delivered by staff of the Department of Fisheries. A survey conducted by AqDP found that, after training, 90 per cent of PAG members had a good knowledge of liming, and 80 per cent knew how to stock ponds, but only 27 per cent knew how to provide supplementary feed.

Likewise the MTR mission for MIDPCR found that group members who had received training in pond fish culture from project NGOs had a good grasp of key information for successful aquaculture. Effective training for aquaculture could be attributed to considerable donor inputs over many years (but now largely ceased) in creating a body of technical knowledge and in training of trainers. This has been effectively disseminated through both the Department of Fisheries (DoF) and NGOs.

### **Case study: Shaitanyanissa – transformed by her knowledge**

Shaitanyanissa is the wife of a day labourer living in Garibpur village of Shinghojhuli union of Chaugacha upazila. Despite having some land, which she inherited from her father, her family income was very low and she was compelled to stop her children's schooling.

In her struggle to tackle such a miserable existence, Shaitan joined an IFAD-funded PAG run by the partner NGO Grameen Unnayan Sangstha (GUS). Here she received training in fish culture, poultry and duck rearing, kitchen gardening and cow fattening. In addition, she received a 3-day training in running a fish hatchery from a regular DoF training programme.

She and her brother established a hatchery getting the necessary capital from a loan of Tk5,000 from GUS, along with selling a plot of land of 10 decimals<sup>9</sup> and leasing out another plot of land, along with some personal loans from relatives. The next year she increased her loan to Tk10,000 and added Tk20,000 to her capital by selling some domestic animals. She took 3 ponds on lease, each of 20 decimals, for use as nurseries to rear newly hatched fry until they can be sold as fingerlings.

At the end of the second year she made a profit of Tk85,100. But in the next year (2004-05), when we first visited her, her hatchery was destroyed by a flood. She was, however, confident of rebuilding her business, since, as she put it, she had specialized knowledge of running a hatchery. When we revisited her in October 2006, she (along with her brother) had taken a hatchery in Jessore on lease, and was using her village ponds as a nursery. She hopes to soon rebuild her own hatchery in the village.

Since she produces more fry than she can raise on her own ponds, she sells fry to her PAG partners. With this, many of the PAG members have shifted from rearing table fish to rearing fingerlings, which is a more profitable activity. Their skill too has been upgraded as they moved from being pond to nursery operators.

From a poverty-stricken family operating land, the knowledge she acquired, enabled her to transform herself into a hatchery operator. She thinks she has gone as far she could with her existing knowledge and skill. According to her, "As an illiterate person it's difficult for me to remember each and every point mentioned in the training, so more refresher training is needed." She would also like additional training to upgrade her knowledge and to keep up to date.

Source: AqDP PCR.

MFTSP commissioned the Bangladesh Agricultural University to research the impact of training on livestock. Data from a sample of 632 households showed that, with training, livestock enterprises performed better – with chickens and ducks starting to lay eggs at a younger age and laying for a longer period, and the calving interval for dairy cows being shorter. Livestock owners who had been trained had increased their number of animals and birds, and broiler, duck, cow and beef enterprises made more profit than

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<sup>9</sup> 1 acre = 100 decimals.

those of owners who had not been trained (although layers and goats did not). This impacted on livelihoods, with income increasing by 30 per cent for those who had been trained compared with only 14 per cent for those without training. However this study did not identify specific technologies that had been adopted as a result of training, and the final impact study for this project found, that out of 284 sample project group members who had received livestock training, almost half (49 per cent) said they had not benefited while only 8 per cent said it had been highly beneficial and 37 per cent said it had been beneficial.

One barrier to the adoption of training (and other promotion of new technology) is non-availability of the new inputs being promoted – such as new varieties of crops, new types of fertiliser and new means of pest control. This is apparent in MFMSFP, with technologies such as USG (urea super-granules), LCC (leaf colour charts) and pheromone traps for pest control in vegetables needing training to be linked to supplies of these inputs through a value chain approach.

MIDPCR trained members of Market Management Committees (MMC) in the functions of these committees. Feedback from MMC training for the first batch of 18 markets showed that, after training, 54 per cent of the 154 members trained fully understood the roles and responsibilities of the MMC, 26 per cent partly understood and 20 per cent had a poor understanding. The training provided was said to have greatly improved the understanding of 58 per cent of respondents, somewhat improved for 25 per cent and made little difference for 18 per cent. However as this training aimed to develop skills of a group, the MMC, it seems that those who did understand the training have been able to implement the new management practices, with other MMC members picking up the system from seeing it being implemented by their co-members.

### **Examples of the impact of training in MIDPCR**

The 2010 MTR mission for MIDPCR came across the following examples of the impact of training carried out by project partner NGOs:

- At Kuakata, poor women (the wives of fishermen made destitute by loss of boats and gear in Cyclone Sidr) who had been training in homestead vegetable gardening, had increased the range of vegetable types available for home consumption and had moved from being net purchasers to net sellers of vegetables.
- Four women in Matibhanga village of Kalapara upazila adopted improved fish culture after training and each earned Tk7,000-8,000 per production cycle while others had taken up homestead gardening and had earned Tk150-1,000 in addition to vegetables consumed at home.
- A poor women, only owning 0.04 acres of land in Char Fasson of Bhola District was trained in vegetable production and had been able to sell cucumbers worth Tk15,000 in a single season.
- Beef Fattening is becoming a popular enterprise and people from Borhanuddin in Bhola District who had been trained in beef fattening were expecting to sell their animals for Tk60-70,000 each at the coming Eid festival, realising a profit of Tk30-40,000 after costs.
- Shabbir, a subsistence farmer from the Nazirpur market area, and a former member of a project Labour Contracting Society, was trained by PMUK and taken on an exposure visit to MFTSP being implemented by PMUK in Gorbati Union. He learnt skills required to establish a mini-hatchery for chickens and ducks. This involves using a lantern to heat the hatching unit rather than electricity. He has invested Tk20,000 to establish this unit and earns about Tk3,000 every month. So far he has made a profit of over Tk18,000.

#### **(b) Training of local level service providers**

Some projects have provided specialised training to a limited number of individuals with the objective that these people will then provide knowledge and technical support to group members and other rural producers.

ADIP provided extra training to one person from each group, who was designated as the “Krishi Sampodok” (KS) – meaning “agricultural secretary”. The objective was for the KS to provide group members with technical support and advice, and to act as a point of contact with DAE. This was not effective - partly as KS were not very well selected or trained, but also because they cannot make much income from providing agricultural advice. In many groups, members said that they had good contact with the DAE Block Supervisor, and could easily contact him directly for agricultural advice – so the KS was not needed. In a project study it was found that, out of a sample of 185, 76 per cent of KS

said that they discussed their training with group members and 37 per cent with other farmers. However they had a poor recall of what learnt in training. Although 57 per cent were contacted for help in last year, this was only by average of only seven persons.

In AqDP some NGOs provided training on social issues to only a few selected group members at their offices, and expected the training to be passed onto other members at group meetings. This dissemination of knowledge was not effective and, if such training was recorded as covering the entire group, could contribute to the apparent over-statement of total training provided.

In MFTSP training of some group members as “poultry workers” has been more successful. These women provide a vaccination service for backyard poultry (some also cover goats). As they can earn a useful income from this work, this can be sustained and some women have been doing this work for many years. It is reported that these vaccination services, along with increased awareness and knowledge of poultry diseases by project group members, has contributed to a significant reduction in the mortality of village poultry. Similar training of poultry vaccinators has been provided in SCBRMP, but this project also trained more general agricultural “activists”, with much the same result as the KS in ADIP.

### **(c) Training of staff**

The effectiveness of staff training can be diminished by turnover of staff. An ADIP study on the capacity building of DAE & NGO staff found that 97 per cent thought their training had been satisfactory. However staff turnover meant that about 30 per cent of trained NGO staff were no longer working in the project (12 per cent had left the NGO, 11 per cent were posted outside project area, 7 per cent got promotion). In contrast, of the DAE staff who got training, 94 per cent of them were still working in the same position.

Turnover of staff has also been an issue in MFTSP. NGOs employed Livestock Technical Assistants (LTA) to provide technical support. Training for LTA was organised by the Project Coordination Unit at a Ministry of Youth Training Centre and at a Department of Livestock Services veterinary college. However a number of LTA have left the employment of the NGOs, or have been promoted to management jobs. MFTSP has therefore had to regularly train new batches of LTA to ensure that an LTA is working at all NGO project branch offices.

Training of the staff of NGO Partner Organisations (PO) of the FEDEC project, being implemented by PKSf, has been very successful in building capacity of micro-finance staff to make larger loans to emerging microenterprises. FEDEC has provided training to PO management and also Training of Trainers. This has developed a cadre of trainers at the PO level and several POs have started own training courses using FEDEC-developed modules to train branch managers and credit officers. Other POs have incorporated microenterprise management training within their regular microfinance management

curriculum. This capacity-building has helped to rapidly expand micro –enterprise lending so that the project had exceeded its target number of micro-enterprise borrowers at the time of the MTR.

#### **(d) Findings of Knowledge, Attitude, Practice surveys**

A KAP (Knowledge, Attitude and Practice) survey is a method for assessing the uptake and acceptability of newly introduced technologies or income-generating activities (IGA). To date IFAD projects have carried out seven KAP surveys. The findings of each of these surveys is summarised in Annex 2. These surveys provide evidence of successful transfer of knowledge and at least some adoption of this knowledge. However they also highlight a number of weaknesses in training provided by projects. Training, whether in a formal classroom environment or at an informal group meeting, is often poorly delivered with inadequate visual aids – as a result trainees often fail to gain adequate knowledge of the technology. Even when trainees do gain knowledge, this is often not applied, the new technologies can be less profitable than farmers' current practices, need inputs that are not available, or are viewed as excessively risky. Trainees would benefit from a more hands-on approach in the delivery of training, with the practical demonstration of technologies, and the selection of technologies for training needs to ensure that these technologies are appropriate for the needs of the target group and profitable relative to farmers' current practices.

#### **Conclusions and recommendations**

Formal training courses are only one method of transferring knowledge and building capacity. IFAD projects have also used demonstrations, field days and exposure visits. The general consensus is that, relative to these other approaches, training is worthwhile (for example, the 2008 supervision mission for SCBRMP concluded that agricultural training was having a bigger impact than demonstrations). However knowledge transfer and capacity building is only one approach to poverty reduction – alongside such things as micro-credit and infrastructure development. Focus group discussions carried out by the PCR (project completion review) of ADIP found that, out of 12 groups, 9 said that credit was the project activity that had the biggest impact on their livelihoods, while 3 said training had the biggest impact. However training was more highly rated than demonstrations.

This review of training in IFAD projects has shown the following:

- i. Nine IFAD projects over the last decade or so have delivered a vast amount of training with over two million training places.
- ii. Much training of project beneficiaries has been very short duration, poorly planned and delivered in a hurry. The emphasis has usually been on quantity (reaching physical targets) not quality.



- iii. Where longer duration training has been offered, it can be difficult for potential users of the technology to find time to attend, with the result that the training ends up being given to people who, for a range of reasons, do not adopt.
- iv. Follow-up in the field has often been effective in complementing training and helping trainees implement what they have learned.
- v. There has been little evaluation of the effectiveness of training – with the notable exceptions of the recent KAP studies carried out by SCBRMP and MIDPCR.

Lessons coming out of this study suggest that future projects would benefit from:

- vi. More time and effort is needed to plan training (during the annual AWPB process rather than in project design);
- vii. More training should be out-sourced to appropriate agencies and more use made of external trainers.
- viii. The value of training should be recognised by the award of certificates of training attendance.
- ix. Using a value chain approach to identify constraints in specific sub-sectors. If lack of knowledge or skill is a key constraint, only then provide much more focused training to overcome the constraint. Projects should not be set physical targets of training large numbers of people.
- x. Using a Farmer Field School (or variant of this) to deliver practical and hands-on training in the field, split into a number of sessions over an appropriate period of time. Farmer-trainers should be used where possible. This would both provide sufficient duration of training to transfer knowledge and skill, and allow busy farmers to find time to attend training sessions<sup>10</sup>.
- xi. Continuing to follow-up training with technical support from project field staff to assist in adoption.
- xii. Systematically evaluating training and continually adapting training methods in the light of lessons learned. This not only includes KAP surveys, but also other forms of beneficiary feedback via participatory M&E and annual outcome surveys.
- xiii. Greater attention to the planning and delivery of high quality training, outsourcing training, award of training certificates, and evaluation of training outcomes will require high calibre training specialists in project management teams.

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<sup>10</sup> The Farmer Field School (FFS) approach needs further consideration before adoption. There are reports that FFS are being dropped in India as being too cumbersome to implement and too time consuming for farmers.

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## **Annex 1: Results of a study on the effectiveness of training**

### **Introduction**

The Smallholder Agricultural Improvement Project (SAIP) was financed by IFAD and implemented between 2000 and 2007. The project covered the districts of Mymensingh, Jamalpur and Sherpur in north-central Bangladesh. The project had five components: (i) Agricultural Development, (ii) Rural Community Support, (iii) Rural Savings and Credit, (iv) Support to Adivasis and Charland areas, and (v) Rural Community Infrastructure. The first four of these components aimed at improving the smallholder agriculture and were implemented by the Department of Agricultural Extension (DAE), assisted by contracted NGOs and Banks, with the fifth component, aimed at developing rural infrastructure to be implemented by the Local Government Engineering Department (LGED).

The project contracted a consulting firm, EADS, in 2004 to carry out two studies into the effectiveness of training and demonstrations. For the training study, 10 technology training subjects were selected for evaluation in terms of adoption, yield, cost of production, input use, credit utilization, net return and change in income and expenditure patterns of the participating farmers. The study covered 4 Upazilas, and 59 villages in Mymensingh district. The household survey was made in 14 villages of Bhluka Upazila, 13 in Sadar, 17 in Ishwargonj and 15 in Haluaghat. Out of 1290 trainee farmers total 138 were interviewed from 61 different SAIP groups. Of these, 68 per cent were female and 32 per cent were male.

Most respondents (75 per cent) reported that they could read and write, but only 41 per cent had been to primary school, with 22 per cent being educated at high school and 12 per cent up to college level. This level of education is above the national average, considering most respondents were women.

The study covered a sample of 59 villages with a total population of 5,234 households (HH). Of these, 1,390 (26 per cent of the total) were project group member households. Of these members, a total of 1,290 (93 per cent) received training from the project and 1,064 had received training in at least one of the 12 technologies covered by this study.

**Table 1: Accessibility of members to training programme of the project**

Sl. #	Upazila	# Village	# Total HH in villages	# SAIP Groups	# SAIP members <sup>1</sup>	# Members received training <sup>2</sup>	# Members received training in study technologies <sup>2</sup>
1	Bhaluka	14	1,177	19	419(36)	404(96)	309(74)
2	Sadar	13	1,521	17	368(24)	351(95)	289(79)
3	Iswarganj	17	1,432	14	304(21)	288(95)	248(82)
4	Haluaghat	15	1,104	15	289(26)	247(85)	218(75)
	Total	59	5,234	65	1,380(26)	1,290(93)	1,064(77)

<sup>1</sup> Percentage of total households in brackets.

<sup>2</sup> Percentage of total SAIP members in brackets.

## Quality of Beneficiary Training Programme

Respondents were asked to rate their satisfaction level over the quality of the training courses organized during the last two years. The table below summarizes their responses against the grading category of good, satisfactory and poor using 13 different indicators.

The training programmes conducted in the district were considered, by and large, to have achieved their objectives, with 81 per cent trainees saying that the courses fulfilled the purposes of technology transfer. Most trainees felt they had been able to participate in the training. On the contrary, most (93 per cent of respondents were not in favour of the training venues used (generally at the Upazila headquarters). People demanded more local venues so that they can participate more easily with less cost and trouble. Most of the beneficiaries did not like the training methods used to conduct the courses, 42 per cent graded them as poor, 41 per cent as satisfactory and only 17 per cent were given good marks. One third (33 per cent) of trainees were also dissatisfied with the use of training materials and aids, with 48 per cent saying these were satisfactory and only 20 per cent finding them to be good. The trainees found selection of training subjects appropriate, 85 per cent graded the contents of training as good against 15 per cent who said they were satisfactory.

Trainees had almost no dissatisfaction on the quality of the trainers/facilitators: 88 per cent of respondents said that the officers who handled the courses are knowledgeable and competent, but 12 per cent graded them as less cooperative. But 89 per cent of participants were dissatisfied with the time management and duration of the training courses. Most of them asked for a longer course duration, but it was not clear whether the longer duration was to get more training allowance or to learn more. During the interview all trainees demanded higher training allowances. However the results

indicated that the organizers should be more careful regarding their time management, timely start of the classes and the schedule of the classes.

Analyzing the results it could be concluded that the trainers should enrich the training classes with more up to date information, the lecture/contents should be simplified with more posters and other visual materials, flip-chart presentations should be used wherever possible. The trainers should pay more attention to the opinion of the trainees.

**Table 2: Quality of training courses as rated by the beneficiaries**

SI #	Parameter	Frequency of respondent			Total
		Good	Satisfactory	Poor	
1	Achievements of objectives	112(81)	23(17)	3(2)	138
2	Scope of participation of beneficiaries	63(46)	51(37)	24(17)	138
3	Use of various training methods	24(17)	56(41)	58(42)	138
4	Use of appropriate training aids and materials	27(20)	66(48)	45(33)	138
5	Relevance of contents with participants working field	117(85)	21(15)	0	138
6	Course duration	4(3)	13(9)	121(88)	138
7	Facilitators knowledge on the subject matter	121(88)	17(12)	0	138
8	Facilitators cooperation with the participants	92(67)	30(22)	16(12)	138
9	Time management by the facilitators	9(7)	6(4)	123(89)	138
10	Presentation capacity of facilitators	125(91)	13(9)	0	138
11	Appropriateness of the venue	2(1)	7(5)	129(93)	138
12	Training allowance	0	0	138(100)	138
13	Overall management	119(86)	19(14)	0	138

## Adoption of production technologies

If, after two years of receiving training in a particular technology, the farmers are still practicing the crop production methods, it can be considered that the technology has been adopted. If some farmers started to practice the systems of production by seeing or learning from a trained member, it can also be considered as adoption through a diffusion effect.

The survey found that 26 per cent of respondents reported that they had fully adopted the technology with another 27 per cent were found to be partially practicing the technology. Partial adoption has been taken to mean that only part of the package of technology on which training was provided has been taken up. For example: for tomato

production a farmer might be following the fertilizer rate or irrigation schedule but not practicing pruning or staking as they were taught to do in the training. In the case of onion cultivation when farmers are practicing the variety and production packages as recommended in the training classes, this can be taken to be full or complete adoption.

The results showed that tomato production and cultivation of onion are most successful technologies in respect of adoption status into the local farmers after receiving the training. 82 per cent trained farmers adopted tomato production of which 65 per cent adopted fully the package of technology as discussed in the training class. The figure in onion is 56 per cent partial and 44 per cent complete adoption.

Establishment of mini fruit gardens in or around homestead was found to widely adopted but with most farmers only partially adopting the recommended package. After getting training the farmers planted different kinds of fruit trees sporadically in their homestead but not as mini commercial fruit gardens as taught in the training courses. So this could not be considered as full adoption of the technology. However the plantation of fruit trees in homestead areas has increased significantly (69 per cent) due to training activities.

The community nursery and community seedbed practices have also been adopted partially as because community production of rice or vegetable seedlings in a common space has not been not practiced as directed during training. Over half (53 per cent) of farmers are practicing ideal seedbed preparation for rice but mostly as individuals, so the adoption has been considered as partial. The observation is similar in case of vegetable seedling production, 59 per cent-trained members have established a vegetable seedling nursery but this is not commonly shared. The adoption situation in poultry vaccination is good: 47 per cent of the trainees started vaccinating as part-time profession. It's a good success because, for village women, the profession is very new and challenging.

The adoption of technologies from the training programme was encouraging in context of diffusion of those techniques among non-members of the project in the locality. More than 10 farmers were found to be practicing (at least partially) the training technologies for each farmer who had been trained. One reason why adoption appears better for farmers who did not get training could be that group members are relatively small farmers (as per project targeting criteria), with only limited land.

**Table 3: Adoption of training technology due to Training Activities of the Project**

Sl #	Training Technology Evaluated	# Member trained	# Member fully adopting	# Member partially adopting	# Non-member adopting	Ratio of member to non-member adoption
1	Preparation of community/ideal seed bed	17	-	9(53)	154	1:17
2	Preparation of ideal community nursery	12	-	7(58)	110	1:16
3	Tomato production	17	11(65)	3(18)	223	1:16
4	Preparation and use of community compost	16	-	6(38)	71	1:12
5	Mixed fruit garden	13	-	9(69)	46	1:5
6	Cultivation of ginger-brinjal mixed crop	16	7(44)	-	63	1:9
7	Poultry Vaccination	15	6(40)	1(7)	90	1:13
8	Onion cultivation	16	7(44)	2(13)	97	1:11
9	Groundnut production	8	3(38)	-	17	1:6
10	Pointed gourd production	8	2(25)	-	26	1:13
	Total	138	36(26)	37(27)	897	1:12

Percentage of trained members in brackets.

In general the adoption of technologies was better for crop production systems like tomato, onion, groundnut and pointed gourd. In all these cases more than 30 per cent farmers were observed to be practicing the package of production technology (full adoption). But technologies like community seedbed, community nursery, community compost, were only adopted partially, and these need more extension activities.

### Reasons for adoption of training technology

Group members were asked about the advantages of technologies which are summarized in the following table. Irrespective of type of technology, three major reasons were mentioned by the farmers as reasons for implementation. These are easy of implementation, profitability and ease of marketing. Many farmers (31 per cent) favoured the technologies due to their easy management and production cultures, with 21 per cent of trainees considering higher financial returns of the technologies, and 19 per cent focused on easy marketing facilities.

If we consider individual technologies it is observed that the ideal seedbed was favoured by the beneficiaries for its easy cultural practices and higher production. Farmers said the advantages of the tomato technology were domestic consumption, higher production, and economic returns as well as ease of marketing. The trainees considered community vegetable seedling nursery as profitable, productive and marketable. The beneficiaries favoured onion cultivation due to its profitability, production, domestic consumable nature, and market facilities. Poultry vaccination is being practiced as it resists the diseases of household birds.



**Table 4: Reasons for adoption of technology by the sample farmers**

Sl #	Training	Sample size	Frequency of response						
			More profitable	Gives more yield	Domestic consumable	Nutritious	Easy to grow/practice	Good market	Disease resistant
1	Preparation of ideal seed bed	9	-	2	-	-	7	-	-
2	Preparation of ideal community nursery	7	2	-	-	2	2	1	-
3	Tomato production	14	4	4	2	-	-	4	-
4	Preparation and use of community compost	6	-	-	-	-	6	-	-
5	Mixed fruit garden	9	3	-	-	-	4	2	-
6	Cultivation of ginger-brinjal mixed crop	7	1	-	-	-	3	3	-
7	Poultry Vaccination	7	-	-	-	-	-	-	7
8	Onion cultivation	9	3	1	1	-	-	4	-
9	Groundnut production	3	1	-	-	1	1	-	-
10	Pointed gourd production	2	1	-	-	1	-	-	-
	Total	73	15 (21)	7 (10)	3 (4)	4 (5)	23 (31)	14 (19)	7 (10)

### Reasons for non-adoption of the training technology

Efforts were made to identify major reasons or causes of partial or non-adoption of the technologies. The reasons were collected from trainees who did not adopt the technologies. Overall, the major reasons for non-adoption were social conflicts (25 per cent of non-adopting farmers), lack of land or cattle (22 per cent), and labour requirements (20 per cent).

For community rice seedbed and community vegetable seedling nursery the major reasons pointed out by the farmers were social conflict. They could not share a common plot for producing seedlings of rice or vegetables that would then be distributed between cooperators. People could not overcome their personal interests for common benefit, so this possibly needs more counseling from project staff. For some members lack of suitable plots restricted them in cultivating tomato even after knowing its cultivation procedures, improved varieties, nutritional advantages and profit margin. 60 per cent farmers mentioned did not practice community compost preparation due to social conflicts, lack of market demand and consequently it was found to be less profitable. Some trainees had no cattle so lost interest in compost making.

Vaccination is a highly technical matter so good skill is needed. Many trainees mentioned that they could not develop the skill of injecting poultry vaccines by attending only one day of training (normally 7 to 10 days training is given on this subject). Another group was concerned about the availability of a sufficient number of chickens in the locality to provide a sufficient demand for the services of a number of vaccinators, so they avoided the taking up the practice. Development of mini fruit gardens in or around homesteads were found to be, by some respondents, a laborious job, but it might be lack of suitable

space was the real reason for non-adoption. For groundnut cultivation several farmers said lack of seeds prevented them from cultivation in the season.

**Table 5: Reasons for non-adoption of technology by the sample farmers**

	Training Technology	Sample size	Frequency of response							
			Not profitable	Needs more capital	No plot/cattle	Labor intensive	Shortage of seedling/input	No market demand	lack of skills	Social conflict
1	Preparation of ideal seed community rice bed	8	-	-	-	-	-	-	-	8
2	Preparation of ideal community nursery	5	-	-	-	-	-	-	-	5
3	Tomato production	3	-	-	3	-	-	-	-	-
4	Preparation and use of community compost	10	2	-	-	2	2	1	-	3
5	Mixed fruit garden	4	-	-	-	4	-	-	-	-
6	Cultivation of ginger-brinjal mixed crop*	9	2	-	-	4	-	-	3	-
7	Vaccination	8	-	-	3	-	-	2	3	-
8	Onion cultivation	7	-	1	5	-	-	-	1	-
9	Groundnut production	5	1	-	1	1	-	-	2	-
10	Pointed gourd production	6	-	-	2	2	1	-	1	-
	Total	65	5 (8)	1 (2)	14 (22)	13 (20)	5 (8)	1 (2)	10 (15)	16 (25)

\* Flies of ginger affect brinjal also and thus production of brinjal is drastically decreased with ginger

## Professional skill development

Effectiveness of training activities towards the professional skill development of beneficiaries were judged through qualitative indicators. Of 138 sampled trainees, 41 per cent believe that the attended training courses were fully effective to their professional development while 44% found partial effectiveness of the activity in daily life. But 15 per cent trainees said the training had no effect for their family development. This is not encouraging. It suggested that more care is needed in selection of trainees for each training courses. The quality of training implementation should be improved by further adopting a participatory methodology and by introducing more visual aids.

## Livelihood Development

The improvement in production and family earnings from the training technology was identified to quantify its effects on the family development of the target population. Each of the trainees were asked to provide the figure on production and additional earnings from the systems/technology he/she started to practice after attending the training course. The production and family earnings of the beneficiaries from selected technologies are elaborated in the following sections.

### (a) Community/ideal seedbed

The concept of community seedbed for paddy is especially suitable for the flood prone areas of the country and it emerged and was tested after the devastating flood of 1998. The project rightly identified the technology for extrapolation in the SAIP area and arranged training to motivate group members so that they would have a good supply of rice seedlings in the season. During the survey it was observed that 50 per cent of the trainees are practicing the preparation of ideal rice seedbed individually, but are not establishing community seedbeds. This partial adoption of the technology resulted in some financial benefit (Table 6) as farmers were able to sell surplus seedlings.

### (b) Community vegetable seedling nursery

Development of commercial production of vegetable seedlings is a potential profitable enterprise for farmers. The project added the community concept to vegetable seedling production and arranged training for group members. Due to the training more than 50 per cent trainees produced vegetable seedlings of early varieties and got unexpected benefits. But the survey observed that none of the group members produced vegetable seedlings following the community concept. They did not share a common plot to produce seedlings but rather grew vegetable seedlings of different kinds by their individual initiative and sold them to their neighbours.

The average numbers of seedlings produced per family and the corresponding earnings have been shown in the following table. The individual trainee has produced almost 10,000 seedlings of either of the crops like cabbage, cauliflower, brinjal, tomato, chili and papaya. The average earnings from selling seedlings were Tk2318 per family.

**Table 6: Benefits from training**

	<b>Members trained</b>	<b>Members adopted</b>	<b>Members not adopted</b>	<b>Average production</b>	<b>Avg sales</b>
Community rice seedbed	17	9 (53%)	8 (47%)	4 decimal	Tk 600
Vegetable nursery	12	7 (58%)	5 (42%)	9,273 seedlings	Tk2,318
Tomato	17	14 (82%)	3 (18%)	62 kg / dec	Tk2,116
Ginger & brinjal mixed crop	16	7 (44%)	9 (56%)	Ginger 34kg/dec	Ginger Tk3,977
				Brinjal 20kg/dec	Brinjal Tk404
Onion	16	9 (56%)	7 (44%)	57 kg/dec	Tk3,001

The members who did not produce vegetable seedlings mostly said that they lacked suitable land. Others mentioned could not manage to buy seeds from the market at the proper time. The adoption rate is quite good if we ignore the community concept. The adoption rate for the technology could be increased further by careful analysis of farmer's environment before enlisting him/her as trainee for any specific production method.

### **(c) Improved production of tomato**

The results indicated that the technology has been widely accepted by the trainees (82 per cent). The major change in the technology package discussed in the training course was the variety (Ruma VF). The technology package also included pruning and staking techniques but, with a few exceptions, farmers were not practicing these interventions. The contribution of the technology adoption was not less than Tk2,000/- per family.

### **(d) Ginger-brinjal mixed cropping**

After attending the training course on ginger-brinjal mixed cropping, some farmers (44 per cent) adopted this cropping system in their field in the following season. The field workers and consultant of the study team visited the group members and their plots, and saw that the performance of brinjal was very poor. It seemed that ginger and brinjal are not compatible to be grown together. Brinjal is highly susceptible to insect attack especially to brinjal shoot and fruit borer and some other flies. It is not advisable to grow brinjal as an intercrop with ginger as the latter is a shade loving densely leafy plant, which can easily harbour all kinds of insects. Farmers said that the brinjal crop was highly infested by insects which caused a low yield. Generally ginger is grown on marginal soil while, in contrast, a good harvest of brinjal needs highly productive and fertile soil. Another consideration is that harvesting of brinjal is a continuous activity (every two/three days) for several months and this would be difficult due to the closely spaced ginger crop.

Even though 44 per cent of farmers adopted the technology, it will certainly not be continued in the next season. However ginger production was encouraging, and the results showed that each of the family earned Tk4,000 to Tk5,000/-. As such the project should take the initiative to promote cultivation of ginger in suitable areas. It is expected that income would be better if group members grow ginger as a sole crop. The crop has a high demand and high value.

### **(e) Improved production of onion**

As an improved crop production technology, onion cultivation was found very effective. After receiving training, 56 per cent of farmers followed the improved technology in the next season. Their yield of onion (14.25 t/ha) is highly encouraging, and each family earned around Tk3000. The response of farmers to onion cultivation is found highly positive. However the beneficiaries cultivated onion using local seeds, so the project should make arrangement to provide good quality seeds of a high yielding variety. Recently an off season (summer) onion variety has been released by BARI.

## Conclusions and recommendations

The general quality of the training was said by the respondents to be satisfactory, although people would like more local venues and longer duration of training, as well as better organization of time and more use of visual aids.

The survey found that 26 per cent of respondents reported that they had fully adopted the technology with another 27 per cent were found to be partially practicing the technology. In general there was more adoption for profitable crops such as tomatoes and onions, while community-based activities for rice seedbeds, vegetable nurseries and compost were generally not taken up by farmers. Ease of management of the technology and availability of markets also encouraged adoption, while lack of suitable land and high labour requirements discouraged adoption.

A similar study was carried out for demonstrations. These often covered the same technologies and it is impossible to differentiate the impact of training from that of demonstration. However it does appear that farmers who have received demonstrations are less likely to adopt than those who have been on a training course (adoption rate for demonstrations was only 18 per cent). Surprisingly the demonstration technologies only seemed to be taken up by about three times the number of farmers who had received a demonstration, compared with 12 times the number of those who had been trained.

Recommendations:

- Training on vegetable/fruit production and its nutritional status should be expanded to cover more male and female farmers.
- The duration of training courses should be based on the needs and nature of the course. If it is highly technical, like grafting/budding or nursery management, the duration should be more than one day.
- The project management should consider the problems of social conflicts in respect of implementing certain technologies and a participatory solution should be identified, otherwise these kind of technologies should not be promoted.
- The venue for training could be modified towards block level venues.

## **Annex 2: Findings of Knowledge, Attitude, Practice surveys**

A KAP (Knowledge, Attitude and Practice) survey is a method for assessing the uptake and acceptability of newly introduced technologies or income-generating activities (IGA). KAP was introduced in Bangladesh by the World Bank/DFID ASSP (Agricultural Support Services Project) in the 1990s. It is particularly appropriate where technologies or IGAs are disseminated mainly through organised events (including training sessions, demonstrations and field days, etc.).

The name 'KAP' summarises three sets of questions about trainees' initial uptake of IGAs or technologies:

Knowledge: does the trainee KNOW what to do (i.e. has she/he remembered the key points of the training?)

Attitude: based on her/his knowledge of the technical approach for the IGA, and knowledge of her/his own circumstances, does the trainee think the IGA is suitable for her/him (and if not, why not)?

Practice: Is she/he actually going to implement the new IGA?

In practical use, the study is often structured as P-K-A:

- is the trainee going to Practice the recommendation?
- if NO, is that because she/he doesn't know how to do it (Knowledge problem);
- if Knowledge is accurate (or reasonably accurate) but the trainee still doesn't intend to Practice, what is the reason for the negative Attitude?

To date IFAD projects have carried out the following six KAP surveys into the outcome of training:

(a) MFMSFP, December 2007, training survey (facilitated by the IFAD M&E Specialist)

- Training topic: Commercial radish production.
- Sample of 30 out of population of 108 trainees, 78 per cent grow radish (61 per cent for sale, 17 per cent for subsistence only).
- Knowledge of training recommendations was generally good – but they may have known much prior to training as have other sources of technical information, such as input suppliers. Weaknesses in training delivery (informal delivery at group meetings, unstructured course, poor training aids, no handouts).

- Practice poor – serious gaps on variety, seed rate, planting method and time of harvest. This may be largely as the traditional system (radish leaf production) is more profitable in this area than the recommended technology (radish root production) due to proximity of the Dhaka market. Some attempted to implement the recommended practices but lost their crops to the unusual weather of October 2007. More important is that, in the social conditions of the project area, most women trainees depend on male relatives to carry out the actual cultivation. The views of trained women are therefore liable to be over-ruled or disregarded by untrained men.
- Recommendations: need a farming systems analysis before training to ensure that the technology will be profitable. Training sessions should be made longer, separated from general meetings, and be more structured, with a well-defined training module (including the information on benefits). Consideration should be given to joint training of women and their male relatives who carry out the cultivation. Consideration should also be given to more practical training, in the form of demonstration plots on farmers' land with field days for disseminating key points to the other trainees.

(b) SCBRMP, January 2008,

- Training topic: boro (winter season) paddy (result of participatory variety selection (PVS) field-days)
- Sample of 45 out of 181 participants of PVS field days.
- Findings: good knowledge (mostly) and some adoption (but not for the recommended seed rate). Non-adoption due to lack of inputs, lack of capital
- Recommendations: select farmers who can afford inputs, need irrigation for hvv boro paddy.
- Conclude: lack of knowledge is not a big issue – farmers know how to grow boro.

(c) MIDPCR, June 2008, training survey (facilitated by the IFAD M&E Specialist)

- Training topic: backyard poultry.
- Sample of 30 out of 150 trainees, 97 per cent keep poultry – all for both income and home consumption purposes.
- Training methods –over half of trainees report use of flip charts, and over 85 per cent say that they were shown medicines. Training sessions held in village – so trainees disturbed by other activities.

- Findings: Only 48 per cent can name an improved breed of chicken (Fayoumi) but none keep improved breeds. Improved breeds are not available and thought to be too risky. Ducks – only 37 per cent can name an improved breed, and only 9 per cent have improved breeds. Good level of technical knowledge only for one key point (litter). Fair for 5 other technical points and poor for 12 points. The level of practice worse than knowledge. But 72 per cent report an increase in production.
- Recommendation: Backyard poultry may not generate sufficient income to make a significant difference to poverty levels. However ultra-poor people do keep chickens, and could be useful secondary income source if an integrated approach used: package includes supply of balanced feed, veterinary coverage, supply of chicks, marketing outlets, credit, supervision, advice and quality training.

### Knowledge and adoption of poultry technology

		Percent of sample*		Main reason for non-adoption
		Knowledge	adoption	
Location of house		60-73	45-82	Lack of knowledge (53%)
Size of house	Chicken	32	23	Lack of knowledge (53%)
	Duck	14	14	
Litter		73	73	
Feed		27-30	0	Lack of knowledge (57%)
Diseases	Chicken	60-97		
	Duck	48-83		
Vaccination method	Chicken Ranikhet	41-60	12-28	
	Duck plague	20	37	

\* range of percentages shows levels of knowledge of a number of different facts about the knowledge item

(d) MIDPCR, September 2008,

- Training topic: beef fattening, 2 day duration
- Sample: 40 from 600 trainees.
- Findings: training quality – respondents consider it to be poor – if flip chart or poster used, it is not well designed and does not put a message across. Practical training in feed preparation would have been useful. Knowledge not good – do not know correct mixture to make UMS. Practice poor: only 25 per cent keep cattle, no adoption of improved feeds or improved breeds, but 97 per cent have knowledge of foot-and-mouth disease (khura), 66 per cent know about vaccination and 50 per cent practice vaccination.



- Conclude: course contents need revision – exotic breeds not relevant for beef fattening. Need hands-on training for feed preparation.

(e) SCBRMP, November 2009,

- Training topic: poultry vaccinator training
- Sample of 35 out of 170 trainees.
- Findings: 91 per cent say satisfied with training, 83 per cent working as vaccinators, knowledge of diseases quite good, but not so good on treatment and some husbandry subjects. Most have secondary education.
- Recommendation: need to select people likely to work as vaccinators, training period should be extended by one week, with more field/practical training, and post training follow-up.

(f) SCBRMP, 2010:

- Training topic: accounts and bookkeeping for CO managers and assistant managers.
- Sample of 42 out of 2632 trained CO Managers and Assistant Managers.
- Findings: knowledge often better than practice – trainees lack motivation and incentives to adopt good practices – especially Assistant Managers.
- Recommendations: split training into a number of stages with refresher training, project staff to follow-up, longer duration of training, trainees should have at least primary education.

(g) MICPCR 2011

- Training topic: poultry rearing (improved breeds, broilers)
- Sample of 45 out of 6,570 group members trained by PMUK (NGO). All are women, only 33 per cent have any education
- Training feedback – only just over half reported use of visual aids (flip chart, poster) and were shown samples of medicines and feeds.
- Findings: All trainees keep poultry, but only four (9 per cent) have improved breeds. Most women keep under 20 birds, except the four with exotic (improved) birds who all have over 40. However 85 per cent say that earning an income is one reason why they keep poultry, followed by 60 per cent who said they keep poultry for household consumption. Most trainees are aware of improved breeds, but all say these risky (due to disease), and most though

them too complex, too costly (85 per cent said they lacked finance), lack of space for a shed, inputs not available, market price fluctuations, and not profitable. Some knowledge about good husbandry practices, but generally not adopted as no space, too costly or lack finance. Good knowledge on diseases and 60 per cent vaccinate – but others say services are not easily available. There is very poor knowledge on feeding, but the four women keeping improved breeds were able to recall almost all training messages). However poultry production has increased since training for 73 per cent of respondents.

- Conclusion: training alone is not enough to introduce modern poultry production. The survey collected data on profitability that showed there was only a 10 per cent margin between costs and returns for broilers (and so are risky due to market price fluctuations), while with minimal production costs, local chickens have a 90 per cent margin. Training on improved technologies for local poultry may be more useful.

### Reasons for non-adoption of improved breeds of poultry

(Multiple answer)

	Type of constraints	No. of response	Percent
1	Complexity to operate	40	98
2	Risky venture (disease prone or mortality rate is high)	41	100
3	Breeds are costly and hardly available in the remote charland areas	30	73
4	Lack of finance	35	85
5	Not cost effective (required high cost, technical skill)	30	73
6	Lack of improved infrastructure (electricity, day-old chick, vaccination)	25	61
7	Doubling in production cost due to poor transportation facilities	20	49
8	Lack of sufficient space in homestead area suitable for poultry housing	15	37
9	Frequent fluctuation of input and output market prices	35	85
10	Lack of sufficient time for supervision	22	54
11	Capital intensive for a landless family	19	46
12	Constraints to hybrid poultry adoption including external dependence	20	49

### Knowledge and adoption of poultry technology

Knowledge regarding:	Level of knowledge* (percent of sample)			Adoption
	Good	Partial	Poor	Percent of sample
Location of house	56-70	15-30	12=24	60-71
Size of house	30-40	20-30	40	22-25
Litter	25-80	15-45	5-30	10-35
Diseases	20-90	10-75	5-30	
Ranikhet symptoms	50-100	0-30	0-20	
Ranikhat control	80-100	0-5	0-5	60 (vaccinate)
Feeding	0-10	10-40	50-90	9 (keep hybrid birds)

\* range of percentages shows levels of knowledge of a number of different facts about the knowledge item.

(h) MIDPCR 2011

- Training topic: homestead vegetable cultivation
- Sample of 40 out of 7,290 group members trained by PMUK (NGO). All are women
- Findings: only 35 per cent have any education, 95 per cent grow vegetables, all have good knowledge of types of vegetables, good knowledge and practice on soil type, sowing method, seed rate, weeding, irrigation and harvesting. Over half know, but few practice improved varieties, correct plant spacing or pest control. This is because women have little access to seed sellers, correct spacing needs more labour, and there does not seem to be a significant pest problem. They also use little or no fertiliser.
- Conclusions: vegetable growing is highly profitable, with average sales per household of Tk3,849 and average costs are only Tk266/household. Although training is generally effective, a longer period (4 days) would help to provide knowledge on a range of different vegetables, and trainees should visit an established grower.

These surveys serve to highlight a number of weaknesses in training – such as selection of training topics and delivery of training, but they also provide evidence of successful transfer of knowledge and at least some adoption as a result of training.

**International Fund for Agricultural Development**

**Initiative for Mainstreaming Innovation (IMI)**

**“Innovative forms of training and capacity-building  
in IFAD supported projects and programmes”**

**Field Study**

**Bangladesh: Evaluation of Training in Mini-Hatchery Technology**

**Edward Mallorie, Nowsher Sarder**

**June 2011**

This paper was prepared by Edward Mallorie and Nowsher Sarder, IFAD Consultants in collaboration with Younus Ali, Showkot and Nasir Uddin (data collection) and Shamsul Alam (data entry and analysis).

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# BANGLADESH

## Evaluation of Training in Mini-Hatchery Technology

### Contents

Acronyms .....	ii
Introduction.....	1
Provision of training.....	3
Outcome of training .....	4
Other sources of knowledge and skill development .....	5
Reasons for non-adoption .....	7
Factors that contribute to success of MH .....	8
Problems faced by MH operators .....	10
Participation of women in MH operation.....	10
Growth and profitability .....	11
Conclusions .....	13
Bibliography .....	15

## Acronyms

d.o.c.	Day-old-chicks
DLS	Department of Livestock Services
GDF	Government Duck Farm, Narayanganj
GO	Government Organisation
MFTSP	Micro-Finance and Technical Support Project
MH	Mini-Hatchery
NGO	Non-Governmental Organisation
PO	Partner Organisation

## Introduction

This study has been commissioned as part of IFAD's Initiative for Mainstreaming Innovation (IMI)<sup>1</sup>. Training is one of the primary means to build the capacity of poor people to participate and fully benefit from mainstream economic development. IFAD places great emphasis on capacity-building and training which are fundamental to the success of development interventions, from agriculture and infrastructure to rural finance and gender equality. Training and capacity-building activities represent an important component in IFAD supported activities and absorb up to 30 per cent of resources in some projects.

The specific objective of this study is to learn lessons from IFAD experience in Bangladesh regarding training and capacity building, and so to improve the effectiveness of training for social development, capacity building, technology dissemination and innovation. In addition to this detailed case study of training on one topic, mini-hatcheries, by one project, the Micro-Finance and Technical Support Project (MFTSP<sup>2</sup>), and more general analysis has been made of training information and data from four closed projects and five on-going projects (one of which has just been completed). The results of this analysis are in a separate report (Mallorie, Sarder 2011).

The transfer of skill and knowledge has been a key element in the success of mini-hatcheries in MFTSP. Mini-hatcheries are small-scale low-cost hatcheries that are constructed from local materials and operated without electricity (Rahman 2007, Rota et al 2008). They form a vital component in development of a model for improved backyard poultry production which involves a chain of linked enterprises including breeding, hatching, chick rearing, egg laying and vaccination services (Dolberg et al 2002).

Mini-hatchery technology has been known in Bangladesh since the 1970's but had not been widely adopted. At the time of the MFTSP design it was widely believed that mini-hatcheries were not a practical proposition and could not compete with large-scale hatcheries in the commercial sector on one hand, or with traditional hatching methods using broody hens on the other<sup>3</sup>. MFTSP has had a remarkable success in promoting these hatcheries, with around 170 to 200 now being operated by project group

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<sup>1</sup> The Initiative for Mainstreaming Innovation is a three-year initiative to enhance IFAD's capacity to promote innovations that will have a positive impact on rural poverty.

<sup>2</sup> MFTSP has been implemented by the Palli Karma-Sahayak Foundation (PKSF), the apex micro-finance agency through 24 of its partner NGOs. The project started in October 2003 and closes in June 2011. The project aims to reduce poverty for around 360,000 female members of PO micro-finance groups by combining micro-finance services with technical support for livestock enterprises.

<sup>3</sup> Reports of poor mini-hatchery performance come from the earlier IFAD/Danida supported Smallholder Livestock Development Project and from the ADB/Danida supported Participatory Livestock Development Project Phase 1.



members. This achievement may be attributed to the practical training that continues for a complete hatching cycle, together with technical support from partner NGOs (called Partner Organisations – PO) field staff.

Up to June 2010 a total of 217 group members have been trained, but only around half of these took up mini-hatchery (MH) operation, while around 50 per cent of functioning mini-hatcheries are being operated by group members who have not been formally trained, but have acquired the knowledge and skills via other routes. This presents an opportunity to investigate the following questions:

- Do MH where operators have had formal training perform better than those operated by people without training?
- To what extent does formal training provide the information and skills needed for MH operation, and to what extent do trained operators obtain information from other sources?
- How do MH operators who have not received formal training obtain information and develop their skills?
- What are the reasons why people who have been trained in MH operation do not take it up?

A brief survey was carried out to provide answers to these questions. This involved interviews with 48 MH operators, and discussions with PO and MFTSP staff. This sample was spread over five of the 10 project districts and six of the 24 project POs<sup>4</sup>. The sample was divided into three sub-samples:

- Those with training who had been operating mini-hatcheries – sample of 16.
- Those with training, but who did not take up operation of mini-hatcheries – sample of 16.
- Those with no training, but who had been operating mini-hatcheries – sample of 16.

Given this small sample size, caution should be used in interpreting results as differences between the sub-samples may well not be statistically significant.

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<sup>4</sup> The districts were Sylhet, Kishoregonj, Gopalganj, Madaripur and Faridpur. The POs were: TMSS, POPI, SSS, GUP, PMUK and SDC.

## Provision of training

Initially MFTSP provided MH training at the Government (DLS) Duck Farm at Narayanganj. This training was very successful, but an outbreak of bird flu made it impossible to continue to use this venue. The project then switched to using the training centres of a number of its POs. These POs recruited successful MH operators to be trainers. The sample includes people who have been trained at the Government Duck Farm (GDF) and by three POs (TMSS, SSS and GUP).

These training venues used two different MH technologies. The rice-husk system is the original MH technology, and involves eggs being warmed by pre-heated bricks in a container that is insulated by rice husks. The sand bed method involves eggs placed on trays of sand which are heated by paraffin lamps. The sand disburse the heat from the lamps and a quilt is placed over the eggs to provide insulation. The sand method is believed to involve less work and produce better results, and is based on a system that has been used for the hatching of duck eggs. However none of the sample adopted a different technology to that used in their training. Table 1 shows the division of the sample in terms of training venue and technology used.

**Table 1: Training venues**

			Training Venue				
			TMSS	SSS	GDF	GUP	Total
Operating status	trained & establish MH	No. of trainees	6	2	2	6	16
	trained , not establish MH	No. of trainees	3	3	4	6	16
	Total	No. of trainees	9	5	6	12	32
Type of MH	Sand-bed	No. of trainees	9	0	0	12	21
	Rice-husk	No. of trainees	0	5	6	0	11
	Total	No. of trainees	9	5	6	12	32

All training was for 30 days, this period covering a full hatching cycle for both duck eggs (28 days) and chicken eggs (21 days). The majority of trainees (22 out of 32) said they preferred a 30 day training period as it covered the full hatching cycle from start to finish. However five said they would prefer 21 days as this was sufficient for a cycle of chicken eggs, and one wanted longer 60 day training to learn how to control temperature and cover the risk period. Four trainees, none of who took up MH operation, said they wanted 14 or 7 days training due to family problems at home. Details are in Table 2. Most LTAs thought that 30 days was the optimal training period,

although three out of 12 said 21 days was sufficient as it could cover a complete cycle for chicken eggs.

**Table 2: Preferred duration of training**

		Preferred duration of training (days)					Total
		60	30	21	14	7	
Trained & establish MH	No. of trainees	1	11	4	0	0	16
Trained, not establish MH	No. of trainees	0	11	1	3	1	16
Total	No. of trainees	1	22	5	3	1	32

All trainees were given written material, which most said would be useful if they needed to remember some point or as a reference source.

### Outcome of training

All trainees are able to cite a number of things they learned during their training. They were asked what temperature should be maintained for eggs to hatch. The correct answer is 100°F during the setting period and 99°F during the hatching period. The majority of respondents with training gave either 100°F or 99°F, both of which can be taken as correct answers (Table 3). Only half of the non-trained respondents replied corrected, and two in this group thought that the temperature should be as low as 70°F.

**Table 3: Knowledge of correct temperature**

		Temperature reported as correct for hatching eggs			Total
		100°F	99°F	<99 °F*	
Trained & establish MH	No. of trainees	2	10	4	16
Trained, not establish MH	No. of trainees	7	7	2	16
Not trained, establish MH	No. of trainees	4	5	7	16
Total	No. of trainees	13	22	13	48

\* Incorrect answers.

However, given the small sample, it would be unwise to draw a firm conclusion from this data. Moreover, MH operators rarely use thermometers, gauging the temperature of eggs by touch. All MH operators, both trained and untrained, knew ways of maintaining humidity in the hatchery.

**Table 4: Mini-hatchery performance**

		Sample Size	Hatching rate			Mortality of d.o.c.
			A	B	C	
Training status	Trained	16	76%	77%	75%	1.6%
	Untrained	13	75%	72%	74%	2.5%
	Average	29	76%	75%	75%	2.0%
Hatching rate 70% or less (no. of MH)	Trained	13	3	4	4	
	Untrained	16	4	6	6	
Hatching rate over 70% (no. of MH)	Trained	16	13	12	12	
	Untrained	13	12	10	10	
Type of hatchery	Sand-bed	20	77%	77%	75%	1.8%
	Rice-husk	9	70%	70%	74%	2.4%
Type of bird	Chicken	12	78%	77%	75%	1.8%
	Duck	6	73%	71%	78%	2.5%
	Both	4	69%	71%	70%	2.3%
A = as reported, B= calculated from input of eggs and output of chicks, C= reported for last 3 batches (may be effected by colder winter temperatures)						

Regardless of how much was learnt, or not learnt during training, overall MH performance is satisfactory. The overall hatching rate (percentage of eggs that actually produce chicks) is around 75 per cent, which is quite acceptable (Table 4).

Data in Table 4 shows that the hatching rate for trained operators was marginally above those who had no formal training, and fewer trained operator have a low hatching rate of 70 per cent or less. However, given the small size of sample, the difference is not significant<sup>5</sup>, and the choice of type of hatchery seems to more important, with the sand bed type performing better than rice husk (but colder winter temperatures may give the latter an advantage).

### Other sources of knowledge and skill development

The lack of a significant difference between the performance of MH with trained and non-trained operators, suggests that operators obtain knowledge and skills from other sources. Data in Table 5 shows that those who have been trained attribute most of their skills and knowledge to training, but a significant proportion also comes from LTA (interesting this was also reported by the sub-sample who did not operate MH and so, one would think, would have less contact with the LTA). LTA (Livestock Technical Assistants) are project staff employed by the partner NGOs, and have had practical training in MH during their initial indication training<sup>6</sup>.

<sup>5</sup> The similarity of performance of MH with operators who have been formally trained with MH with non-trained operators is confirmed by project data for the period to September 2006. Out of 156 MH, the hatching rate for 75 with trained operators was 71.2 per cent, while the hatching rate for the 81 MH with non-trained operators was 74.6 per cent.

<sup>6</sup> It is interesting to note that out of 12 LTA interviewed, only one specifically mentioned MH as one of the useful things that they learned during their training

**Table 5: Sources of skill and knowledge**

	Sub-sample	Sources of skill and knowledge					Total
		training	neighbour	relatives	LTA	Other <sup>1</sup>	
Percent of skill & knowledge from different sources	Trained, establish MH	61%	2%	6%	28%	3%	100%
	Trained, not establish MH	74%	0%	2%	24%	0%	100%
Number of respondents reporting skill & knowledge from source	Trained, operate MH	16	1	2	16	2	16 <sup>2</sup>
	Trained, not establish MH	16	0	3	15	0	16 <sup>2</sup>
	Non-trained, establish MH		2	5	13	3	16 <sup>2</sup>
<sup>1</sup> other sources include knowledge acquired before training and from other MH operators. <sup>2</sup> sources add up to more than 16 as multiple answers are possible.							

Almost all the respondents in the trained sub-samples gained information from LTA, as did the group who were operating MH with no formal training. This latter group also seem to have got a little more information from neighbours, relatives etc. Assistance from LTA includes learning about controlling temperature and humidity, egg selection, egg turning and hatching. Two said the LTA taught them the sand-bed system.

LTAs interviewed reported that their support reinforced what had been learned from training, especially regarding control of temperature which emerges as a key factor in successful MH operation. They said their support also solved problems, such as marketing of d.o.c., and resulted in reduced production cost, increased hatching rate and greater profits. Most LTA thought there was enough contact between MH operators to enable them to exchange experiences, although four out of 12 thought that more contact would be useful.

It should be noted that the project design did not envisage that MH would be established without formal training – dissemination of the technology to non-trained group members was an initiative of POs and their LTA's.

All MH operators use a mobile phone to contact people for advice (Table 6). Both training and LTAs were cited as the main sources of inspiration for those operating MH (Table 7).

**Table 6: Sources of advice via mobile phone**

Person contacted	No. of MH operators
LTA	26
PO branch manager	7
Farm manager (of GDF?)	1
Neighbour	6
No response on who contacts	3
Total MH (multiple responses)	32

**Table 7: Inspiration to establish MH**

Source of inspiration to start MH	Trained operators	Non-trained	All MH operators
Training	16	0	16
LTA	16	14	30
Other MH owner	1	1	2
Neighbour	1	4	5
Relative	2	6	8
Other NGO staff	0	1	1
Total MH (multiple responses)	16	16	32

The sub-sample of MH operators who had not received formal training were asked why they had not been on a MH training course. The most frequent response was lack of time (Table 8).

**Table 8: Reasons not to attend MH training**

Reasons for not attending formal training	No. of response
Did not hear in time	3
Lack of time (especially during training period)	7
Did not think it would be useful	1
Family trouble	5
Total	16

### Reasons for non-adoption

People who were trained, but did not operate a MH, gave a range of reasons for not taking up MH operation (Table 9). In particular they said they lacked the money (although they have access to micro-credit loans), and/or lacked the time and labour. With regards to the latter point, some mentioned having children at school, having a job with an NGO, and the work being too laborious. A significant number had problems in finding fertile eggs or selling chicks, and two mentioned technical problems (temperature control and bad results for the first batch). The fact that around half of people who are given MH training do not take up MH operation suggests that greater care is needed in selecting people for this training.

**Table 9: Reasons not to establish MH after training**

Reasons for not taking up MH after training	Number of trainees	Percent of trainees
Lack of money	13	81%
Lack of time, labour	13	81%
Supply of egg, market for d.o.c.	7	44%
Technical problems	2	13%
Family trouble	6	38%
Sickness	3	19%
Total (multiple responses)	16	100%

Three of the sample of 16 MH operators who had not been trained reported that they had now ceased operations. Each gave two reasons for stopping, which were lack of supply of fertile eggs (two MH), lack of a market for d.o.c. (two MH), lack of time and family problems.

### Factors that contribute to success of MH

Table 10 shows that those who are trained and establish MH have more education than those who do not – 74 per cent are educated at class VI and above, compared with only 25 per cent for those who are trained and do not establish MH. However only 19 per cent of those who establish MH without training have education at class VI and above.

**Table 10: Education of MH operators**

Types of MH operator	Level of schooling (percentage in brackets)					
	No schooling	Up to Class V	VI-X	SSC	HSC	All
Trained and establish MH	2 (13)	2 (13)	6 (37)	4 (25)	2 (12)	16 (100)
Trained but not establish MH	0(0)	12 (75)	1 (6)	3 (19)	0 (0)	16 (100)
Not trained but establish MH	5 (31)	8 (50)	2 (13)	1(6)	0 (0)	16 (100)
All	7 (15)	22 (45)	9 (19)	8 (17)	2 (4)	48 (100)

Wealth levels could have some impact on the success to MH operation. Very poor households could lack the resources to make a success of the business, while well-off households may not want to undertake the work involved. However households in the three sub-samples appear to be of broadly similar wealth levels. In all sub-samples, almost all households own homestead land, but only about one third own cultivated land, with one quarter leasing in crop land (Table 11).

**Table 11: Access to land**

Types of MH Operator	Number of respondent (percentage in brackets)				Total sample
	Homestead	Crop land	Lease in	Lease out	
Trained and establish MH	16 (100)	5 (31)	4 (25)	2 (13)	16 (100)
Trained but not establish MH	15 (94)	6 (38)	4 (25)	0 (0)	16 (100)
Not trained but establish MH	16 (100)	6 (38)	2 (13)	1 (6)	16 (100)
All	47 (98)	17 (35)	10 (21)	3 (6)	48 (100)

Data on the average area of land per household shows that households which received training but did not establish MH own a little less land than the other two sub-samples, but offset this by leasing in more land (Table 12).

**Table 12: Average area of land per household**

Types of MH operators	Average area of land (decimal) for all households					
	Homestead	Crop land	Total own	Leased in	Leased out	Total net operated
Trained and establish MH	16.6	53.9	70.5	26.1	6.9	89.6
Trained but not establish MH	13.5	46.3	59.8	36.9	0.0	96.9
Not trained but establish MH	29.5	61.9	91.4	12.5	3.8	100.2
All	19.8	54.0	73.8	25.1	3.5	95.5

MH operators were asked to identify the key factors for success of their MH business. Over half cited investment of capital and labour, and the related allocation of time for MH work. Marketing of d.o.c. and supply of fertile eggs were also important. Over one third of both trained and non-trained operators said attending training was important (for the non-trained group this might include mentoring from the LTA). Direct support from the LTA was given almost as much importance by non-trained group, but less by those who had formal training (see Table 13).

**Table 13: Key factors for success of operating MH**

Response	Trained and establish MH		Not trained but establish MH		All	
	No.	%	No.	%	No.	%
Investment of capital and labour	10	63	8	50	18	56
Allocation of time for MH	10	63	7	44	17	53
Attendance at training	6	38	6	38	12	38
Credit facility	1	6	3	19	4	13
Supply of fertile egg	4	25	1	6	5	16
Sufficient market for DOC	7	44	5	31	12	38
Assistance of LTA	2	13	5	31	7	22
Total (multiple answers possible)	16	100	16	100	32	100

The LTAs identified the key factors for successes of MH to be: (i) a sufficient supply of fertile eggs; (ii) good demand and a fair price for d.o.c.; and (iii) attending MH training.



## Problems faced by MH operators

Sample MH operators said that their main problems were poor profit margins, with over one third saying egg prices were too high and chick prices too low (Table 14). In 2007, at the time of the project's Mid-Term Review (MTR), chick prices were around Tk18.00, three times that the Tk6.00 paid for fertile eggs. Data from this survey shows that, for chickens average chick prices are Tk21.61, which is only 2.5 times the average egg cost of Tk8.68.

**Table 14: Problems in operating MH**

Response	Trained and establish MH		Not trained but establish MH		All	
	No.	%	No.	%	No.	%
Maintaining temperature	2	13	2	13	4	13
Collection and high price of fertile egg	8	50	4	25	12	38
Low price of d.o.c.	6	38	5	31	11	34
Space shortage for establishing MH	0	0	2	13	2	6
Lack of training	0	0	2	13	2	6
Lean period of winter	2	13	2	13	4	13
Others	3	19	5	31	8	25
Total (multiple answers possible)	16	100	16	100	32	100

LTAs also confirmed the main limitations for MH were the non-availability and high cost of fertile eggs, low price of d.o.c., and difficulty in maintaining temperature during winter. The major reasons identified for failure of MH were: unavailability of fertile egg, lack of attentiveness of MH owners, and lack of markets for d.o.c.

## Participation of women in MH operation

MH operation and MH training seems to benefit women. A relatively high (compared to the population as a whole) of all sub-samples are from female-headed households (FHH), with them making up one third of all households in the overall sample (Table 15). However relatively few (only 19 per cent) of the households that have established MH with no formal training and FHH, suggesting that such women are more likely to establish MH if they get formal training. FHH operate a net total of 81 decimals of land (not significantly less than other households) and achieve the same hatching rate of 75 per cent.

**Table 15: Female headed households**

<b>Types of MH operators</b>	<b>No. of FHH</b>	<b>% of total</b>
Trained and establish MH	6	37.5%
Trained but not establish MH	7	43.8%
Not trained but establish MH	3	18.8%
All	16	33.3%

Women MH operators who have had formal training also have a relatively larger role in the management of their MH. Where the woman group member (all MFTSP group members are women) relies on informal assistance from the LTA, it seems more likely that her husband or others will take a relatively large share in the management of the MH (Table 16).

**Table 16: Management of MH**

<b>Types of MH Operators</b>	<b>Management of MH (work shared by %)</b>			
	<b>Wife</b>	<b>Husband</b>	<b>Son/daughter</b>	<b>Others</b>
Trained and establish MH	67	26	5	2
Not trained but establish MH	47	35	2	8
All	57	31	4	5

### **Growth and profitability**

The survey also gathered information on the growth and economic performance of MH. Sub-sample averages for trained and non-trained groups are distorted by six specialised duck MH (three in each group) which are considerably larger operations than the chicken (or chicken plus duck) MH. The duck MH have been shown separately in Tables 17 and 18. Table 17 shows that the non-trained group made a larger initial investment in their hatcheries, and still have a larger capacity than the trained group. This suggests that this group may have greater resources available, and/or are more interested in running MH as a real income generating enterprise.

**Table 17: Investment and capacity of MH**

		N	Initial		Present		Growth	
			Investment Tk'000	Eggs, no.	Investment Tk'000	Eggs, no.	Investment	capacity
All	trained	16	10.15	415	74.15	3,877	631%	834%
	non-trained	13	26.15	746	110.72	4,554	323%	510%
	Total	29	17.32	563	90.54	4,180	423%	642%
Chicken	trained	13	8.34	249	11.26	464	35%	86%
	non-trained	12	10.50	320	23.93	520	128%	63%
	Total	25	9.28	280	16.77	488	81%	74%
Duck	trained	3	18.00	1,133	346.67	18,667	1,826%	1,547%
	non-trained	3	78.33	2,167	400.00	18,000	411%	731%
	Total	6	48.17	1,650	373.33	18,333	675%	1,011%

The profitability of MH operation is shown in Table 18. Although MH with trained operators have slightly lower purchase cost for fertile eggs and higher sale price for d.o.c., their smaller scale of operation means that chicken MH (which include chicken plus duck MH) with non-trained operators generate a bigger annual margin over the cost of fertile eggs.

**Table 18: Profitability of MH**

		Chicks per batch	Batch per year	Chicks per year	Egg price Tk	Chick price Tk	Sales per year Tk'000	Margin* per year Tk'000
All	trained	819	14.9	12,186	8.06	21.19	258	129
	non-trained	1,039	16.8	17,396	8.85	20.31	353	148
	Total	918	15.7	14,386	8.41	20.79	299	139
Chicken	trained	231	10.9	2,527	8.00	21.69	55	28
	non-trained	380	9.9	3,759	9.10	21.50	81	36
	Total	296	10.5	3,108	8.48	21.61	67	33
Duck	trained	3,367	32.0	107,733	8.33	19.00	2,047	823
	non-trained	3,233	37.3	120,711	8.00	16.33	1,972	624
	Total	3,300	34.7	114,400	8.17	17.67	2,021	732

\* margin is calculated as no. of chicks sold x (price of chicks less prices of eggs / hatching rate).

On average chicken MH generate a margin over egg cost of Tk33,000 per year – or Tk2,700 per month, which is not an unreasonable amount as a part-time job for a woman alongside other household tasks. The duck hatcheries are much larger scale

enterprises generating sales of about Tk2 million per year, and probably employing some workers. The margin between the cost of fertile duck eggs (Tk8.17) and sale price of duck d.o.c. (Tk17.67) is only 116 per cent of the cost of eggs, compared with 155 per cent for chickens, but this is offset by their greater scale of operation.

MH operators spend more of the additional income generated on household consumption. The majority (75 per cent) report additional family expenditure, and 56 per cent said they spent more on their children's education. Income was also invested: 28 per cent said they have invested in a model breeder farm (which will ensure a supply of fertilise eggs for the MH), 22 per cent on buying a cow, 16 per cent on shops/small business, and 16 per cent purchased or leased in land (Table 19).

**Table 19: Use of income from MH**

Investment of MH profit	Trained and establish MH		Not trained but establish MH		All	
	No.	%	No.	%	No.	%
Model breeder farm	4	25	5	31	9	28
Family expenditure	13	81	11	69	24	75
Establishment of small shop	3	19	2	13	5	16
Purchase of cow	6	38	1	6	7	22
Education expenditure	8	50	10	63	18	56
Fish farm	2	13	0	0	2	6
Land leasing/purchase	2	13	3	19	5	16
Housing	1	6	0	0	1	3

## Conclusions

Training, together with follow-up from technical staff, has enabled poor women to become successful operators of MH. Hatchery technology, at least for chickens, was not known at the village level in Bangladesh, so it can safely be said that successful operation of MH can be attributed to project training and support. However, around half of all people who get this training do not establish a MH – for a range of reasons including the investment needed, the need for very regular and reliable labour inputs, and problems in the egg-chick supply-marketing chain. At the same time, around half of all MH are being operated by project group members (or their families) who have not received this training but have had the support from project field staff. Many of this group say that the reason why they did not attend the training was lack of time to take a month out away from home.

So it seems availability of time is a critical factor for both successful operation of MH and for attending MH training. The former requires regular and reliable short inputs throughout the day (and into the late evening) to turn eggs and check temperature, which the latter needs one month to be set aside to attend a residential training course. Some women can find the short inputs needed for MH operation, but cannot take a

month away from home to attend formal training – and so may take up MH with the support from an LTA but without formal training. Other women can find time to attend a month of formal training, but then find it difficult to allocate the regular time slots needed for MH operation, and so fail to take up MH operation.

This could lead to a conclusion that the formal training is not really useful or needed – it would avoid unnecessarily training people who do not establish MH, while LTAs can directly assist and advise people who are actually setting up MH. However project staff have reservations about simply abandoning formal MH training – it may provide a catalyst and focus for LTA support for MH – which they then extend to other group members who have not attended training. There may also be gaps in what LTAs know about MH, and LTA and over one third of MH operators say that attending training is a significant factor contributing to the success of MH enterprises (although the most important issues are having enough time/labour, enough capital and an adequate margin between egg and chick prices). Moreover formal MH training does seem to reach a larger proportion of female-headed households and results in women (who attended the training) taking a greater role in MH management – so making MH a more effective tool for poverty reduction and women's empowerment.

The answer may be to re-design the formal training – moving it to a village location and holding a series of short regular sessions on the pattern of a Farmer Field School, rather than requiring that trainees attend a full time course for one month.

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