Impact Evaluation of Barind Command Area Development and Training Project (Revised)

Carried out by

Evaluation Sector

Implementation Monitoring and Evaluation Division (IMED)

Ministry of Planning, Government of People's Republic of Bangladesh

Conducted by

Research Evaluation Associates for Development Ltd. (READ)

May 2010

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Abbreviation

BMDA	**Barind Multipurpose Development Authority**
BBS	**Bangladesh Bureau of Statistics**
BCC	**Behavior Change Communication**
BDHS	**Bangladesh Demographic and Health Survey**
DTW	**Deep Tube Well**
DAE	**Department of Agricultural Extension**
DG	**Director General**
GOB	**Government of Bangladesh**
HYV	**High Yielding Variety**
HHs	**Households**
IEC	**Information, Education and Communication**
IMED	**Implementation Monitoring and Evaluation Division**
LWTA	**Low Water Table Area**
NGO	**Non-Government Organization**
PCR	**Project Completion Report**
PP	**Project Proforma**
PSU	**Primary Sampling Unit**
QCO	**Quality Control Officer**
READ	**Research Evaluation Associates for Development Ltd.**
STW	**Shallow Tube Well**
SPSS	**Statistical Package for the Social Sciences**
SOCMOB	**Social Mobilization**
ToR	**Terms of Reference**
WMC	**Water Management Committee**

Table of Content

Executive Summary

Background: Part of northern Bangladesh where climatic characteristics, topography and soil conditions are significantly different form other areas of the country is known as "Barind Tract". All the 25 Upazilas under Rajshahi, Chapai Nawabganj and Naogaon districts covering 0.775 million hectare of land is the territory of the project. Total population of Barind area (middle, small and landless farmers) is about 5.6, million of whom 85% lives in the rural areas. Previously in the Project area, 40% of the irrigation water flowing through kaccha channels was lost. The current project was designed and implemented to prevent wastage of irrigated water.

Project Summary: Administrative Ministry/Division: Agriculture

Executing Agency: Barind Multipurpose Development Authority (BMDA)

Implementation period: 1996 to 2006

Total costs: (In lakh Taka) GOB Total: 13,804.56 (Source: IMED Evaluation Report of June, 2006)

Project objectives (summary) were to:

a. Elevate the socio-economic conditions of the people in the project area.
b. Sustain self-sufficiency in food production for deficit area of the country.
c. Minimize system loss of irrigation water and achieve irrigation efficiency.
d. Increase the cropping intensity from 117% to 222% and year round recommended cropping pattern in the area.
e. Build a group of efficient and technical man power through intensive training on deep tube well operation, maintenance, irrigation and water management, construction and maintenance of water control system, crop production and fertilizer use, crop diversification, afforestation, pisciculture.
f. Create additional job opportunities for the small and marginal farmers.

Evaluation Objectives (as per ToR)

- To review the implementation status of the following components of the project: Construction works of the channel/water distribution system; Construction works of training shades/centres & training programs conducted; Repair and maintenance of channel/water distribution system; and Procurement of office and field equipment.
- To assess the impact of the following components of the project after implementation: Self-sufficiency of the beneficiaries in food production; Increase the cropping intensity; Additional job opportunity created for the farmers, day labourers and women; Skill and efficiency of trainees; Socio-economic development and standard of living of the beneficiaries; Impact on environment; and Sustainability of the project.

Study Methodology: The methodologies of the Impact Evaluation Study comprised both quantitative survey and qualitative in-depth investigations. To assess the impact of the project interventions, data were obtained from the beneficiaries and stakeholders on time scale: obtained estimates on the benefits gained (agricultural production, income generation and improved standard of living) both currently and retroactively (5 years prior to data collection). An attempt was also made to compare relatively high performing (having **more** than average levels of coverage of hectares of land by irrigated water) and low performing (having **less** than average levels of coverage of hectares of land by irrigated water) areas.

Sampling and sample size for Quantitative Survey: A two-stage stratified sampling procedure was applied to select the sample. At the first stage, Primary Sampling Unit (PSU: village) was selected. PSU was within 2 km of the implemented project area. Second stage, households were selected from each PSU. The samples were determined scientifically with a given degree of accuracy at a given level of statistical significance. A random sample of 12 Upazilas (4 in Rajshahi, 3 in Chapai Nawabganj and 5 in Naogaon Districts) were selected from 25 upazilas. From each selected Upazila, 2 Unions and from each selected Union, 2 villages and from each village, 100 households were selected randomly. Total sample spots were: Districts = 3; Upazilas= 12; Unions = 24; Villages = 48; Households = 4800; and Respondents = 6000 (male=4800; female=1200). All the households were selected using systematic random sampling. From each selected household (farmers), one adult male preferably head of household was interviewed. In addition, from every fourth household, a married woman (preferably wife of the male respondent) was also interviewed regarding their food production, consumption and other aspects of life. Random selection ensured distribution of households by poor and non poor proportions.

Sample for Qualitative Investigations:

- Physically check 48 Deep Tube Wells (one per village: PSU) connecting both buried piped and pucca (where available) channels;
- Physically check the training shades;
- Conduct Intensive interviews with trainees;
- Conduct Intensive interviews with personnel at Districts, Upazillas and at the BMDA HQ levels;
- Conduct Local level Stakeholders' Workshop; and
- Review of relevant documents: PP, PCR and relevant reports.

Data collection: Seven different types of data collection instruments were developed and pre-tested for the study: Pre-coded structured and standardized questionnaires for Household Survey for Adult males and females; Semi-structured open ended questionnaires for Intensive Interviews with Trainees; Semi-structured open ended questionnaires for Intensive Interviews with BMDA and allied department officials at Upazilla level; Semi-structured open ended questionnaires for Intensive Interviews with BMDA and allied department officials at District level; Checklist for Observations by Physical Verifications of Piped and Pucca irrigation channels connected with 48 DTWs, one per village; Checklist for Observations and Physical Verifications of Training Shades; and Checklist for Assessment of conducted training programs.

In total 46 eligible survey manpower, both males and females, were recruited by READ for data collection. All the recruited manpower for field investigation was trained for 5 days. Data collection activities at the field level commenced on 18th October, 2009 and ended by 16th November, 2009. Data collection was adequately supervised and monitored by expert consultants to ensure quality. All the targeted interviews were completed:

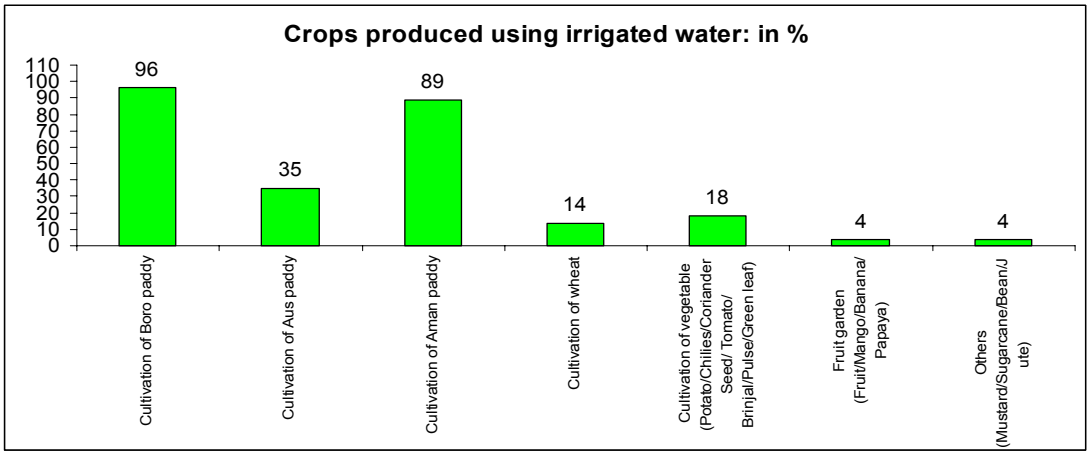
- **Quantitative survey at household level:**
  - Male Adult Respondents: Head of Household: 4800 (100%);
  - Female Adult Respondent: 1200 (100%)
- **Qualitative in-depth investigations:**
  - Intensive interviews with Trainees: 182 (94%);
  - Upazillas, Districts and BMDA HQ Intensive interviews of project personnel: 94 (94%);
  - Observations and Physical Verifications: Piped and Pucca Channels connected with 48 Deep Tube Wells: 30,176 meters (103%); Training Shade: 1 (100%).

Data Analyses: Findings:

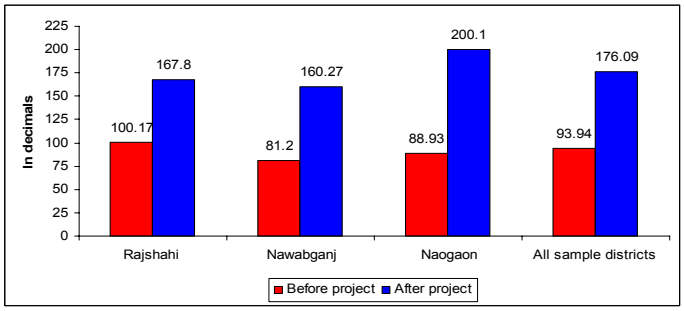
The mean age of the male adult farmers is 42 years. The mean age of the adult females is 33 years.

Irrigation System: Operational Efficiencies

Majority of the respondents (80%) were aware about Barind project. Although 68% of the farmers mentioned that local committees were formed; but overwhelming majority of the respondents (91%) did not participate in the project. Of the 9% farmers who claimed to have participated in the project (contributed labor or in the committee) remarked that the participation of the women was almost nil or very meager (2.7%). There are currently, on average 4 Deep Tube Wells (DTWs) per village; the number of DTWs per village by the high and low performing areas vary by one, i.e., high performing areas have one DTW more than that in the low performing areas. All the established DTWs were found currently in operational conditions. However, in some villages, very few DTWs were found non functional and the reasons were: meter not functional; water layer too low and the absence of electricity. All the DTWs are connected by Piped (71%) and Pucca Channels (29%). The average lengths in meter of the piped channels are 614 and that of pucca is 606 meters. Hundred percent of the farmers (respondents) use the irrigated water (either from piped or from pucca) for farming. Irrigated water is used for production of high breed (9%), HYV (74%) and local varieties (17%). The varieties of crops produced using the irrigated water are shown in the bar graphs below:



About half of the plots (49%) either are adjacent or very near to the irrigated channels; 36% of the plots are too far away, while 15% fall at the middle section. Bar graphs illustrate the coverage of land per family by irrigated water from the Deep Tube Well by Districts both at pre and post project implementation periods:



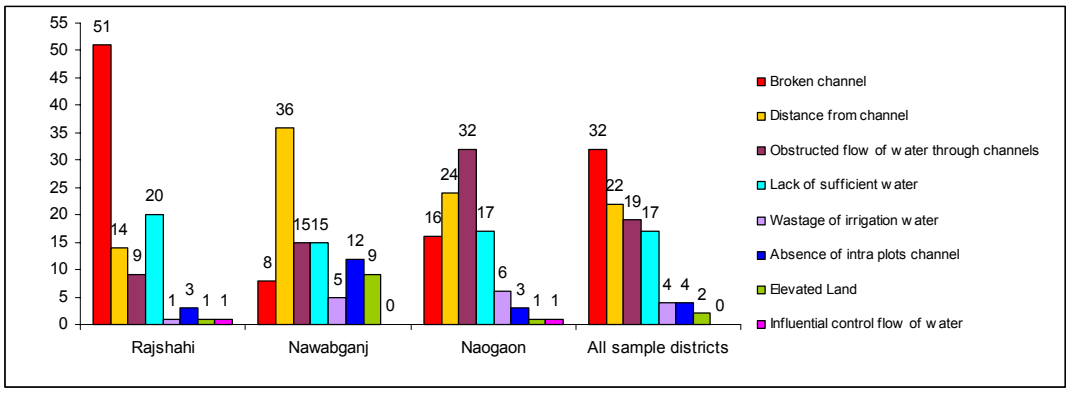
The proportional improvements of the coverage of irrigated land during post project over the pre project in terms of additional coverage of land are: in Naogaon 56%; in Chapai

Nawabganj 49%; and in Rajshahi 40%. The farmers from both Rajshahi and Naogaon enjoy privileged status, as in these places, more than 80% said that irrigated water is distributed on rotation (on equity); only 13% said that they received it on demand (when necessary) and only about 5% said that it depended on the decisions of the distributors. But the scenario in Chapai Nawabganj is quite different, where only 52% said that irrigated water is distributed on rotation, 35% on demand and 13% on the decisions of the distributors.

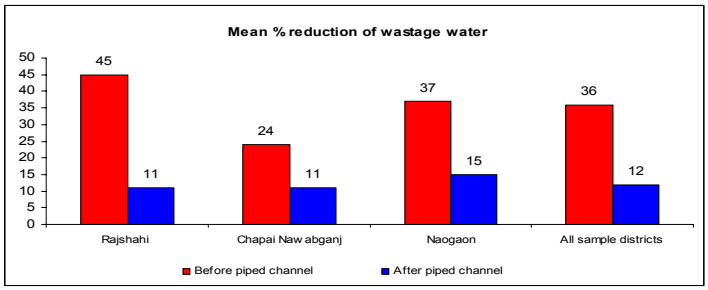
By overall assessment for all three districts, 92% beneficiaries use DTW water for irrigation either sufficiently or partially. Comparatively, assessing the status of availability of water sufficiently or partially, the situation in Naogaon (97%) is the best, followed by Rajshahi (92%) and next Chapai Nawabganj (85%). Insufficiency of DTW water is experienced primarily due to lack of uninterrupted supply of electricity: Naogaon (58%), Rajshahi (65%), and Chapai Nawabganj (50%). The other reasons for shortfall of DTW vary by districts:

- Naogaon: Influential consumes excess water (14%); cover too many/large plots (13%); defaults by Management Committee (MC) (8%);
- Rajshahi: Low level of water (16%); cover too many/large plots (6%); use of Kaccha channels (6%); and
- Chapai Nawabganj: Negligence of MC (15%); cover too many/large plots (15%); Influential consumes excess water (15%).

About ninety percent of the respondents did not face any problem related to channels (piped/pucca): Chapai Nawabganj (94%), Naogaon (89%), and Rajshahi (84%) and the reasons or specific problems are as follows (see bar graph)

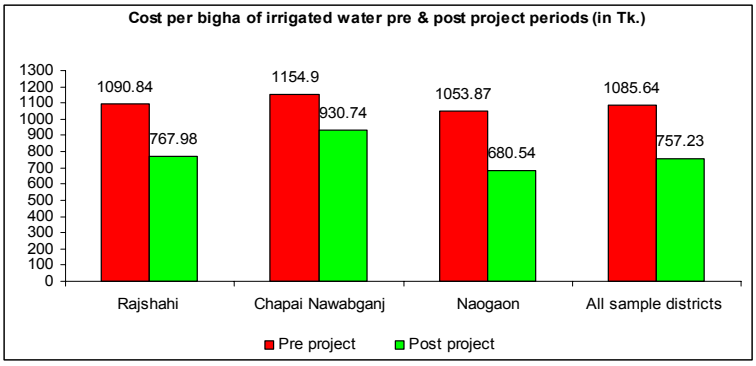


Over ninety percent of the respondents irrespective of districts and high and low performing unions, claimed that the level of wastage of water reduced substantially after establishment of the piped channel system. The bar graphs below illustrate proportion of wastage at pre and post piped channel systems comparatively.



The mean reduction of the wastage of irrigated water was by two thirds at post piped channel system compared to previous kaccha channel system.
Majority of the respondents (58%) claimed that the cost per unit (bigha) of irrigating water

has been reduced during post project implementation period compared to pre implementation. The bar graphs below illustrate the comparative cost reduction.



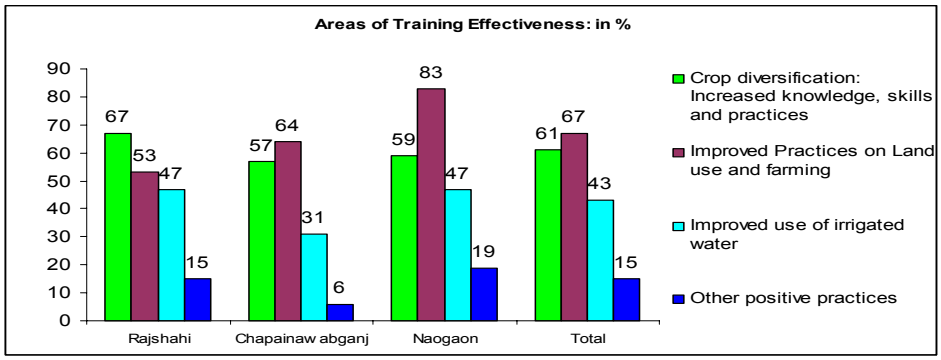
In the overall, the reduction of the costs for irrigated water per bigha is Tk 328 (30%) comparatively at post project implementation period over the pre project.

Repair and Maintenance: Ninety one percent of the DTWs are found as satisfactory; similarly 82% of the buried pipe channels were found satisfactory; but only less than half of the pucca channels (43%) was found satisfactory. As regards pucca channels, the conditions are worse in Rajshahi (70% unsatisfactory); while in Naogaon and in Chapai Nawabganj, roughly 50% are either satisfactory or unsatisfactory. About a fifth of the Piped channels (22%) in Naogaon was found unsatisfactory. Both in Rajshahi and in Naogaon, the Care Takers performed most (85 to 92%) of the functions of repairs and maintenance of both DTWs and Piped/Pucca channels, but in Chapai Nawabganj, the Care Takers performed barely more than half (51%) of the functions, while the BMDA persons performed one third of the repair functions.

Most of the costs for repair and maintenance of the DTWs and the channels are borne by the beneficiaries: 60% in respect of DTWs and 62% in respect of the channels. But in Naogaon, the costs of repair and maintenance of the DTWs are shared almost equally: Beneficiaries—37%; Care Takers—45%; and BMDA—34%. A bare majority of the respondents claimed that the repair and maintenance works of the DTWs are done at an appropriate time, i.e. before on set of the cropping seasons/on the eve of using water (58%); but nearly half of them (42%) claimed that for the repair and maintenance, there is no fixed time, it is done year round.

Training Assessments: Of the trainees interviewed, 79% (144) are ideal farmers, followed by 29% (53) are tube well operators/drain men/coupon dealers, 10% (18) are fish cultivators, 4% (7) are mechanic or assistants, and 4% (8) are nursery workers. Current engagements of the trainees, as specified, exceed 100% as some of them perform more than one function. Training of ideal farmers covered 9 major topics and the most covered areas are: Crop diversification/production of more crops (73%); proper use of fertilizer and pesticides (58%); Collection of improved seeds and identify its quality (39%); and proper use of water on land (10%). According to the trainees', the level of knowledge, skills on imparting training of the trainers were very good (25%) and good (64%); level of quality of the training was very good (18%) and good (56%); 68% trainees opined that overall class room environment and sitting arrangements in the training session was good; 43% of the trainees mentioned that quality of food served to the trainees was good; 36% of the trainees mentioned that use of training materials in the training sessions were good; and only 5% trainees assessed the training as ineffective due to inadequacy of practical training.

Training Effectiveness: The assessments by the trainees on after training effectiveness show following outcome (as in Bar graphs):



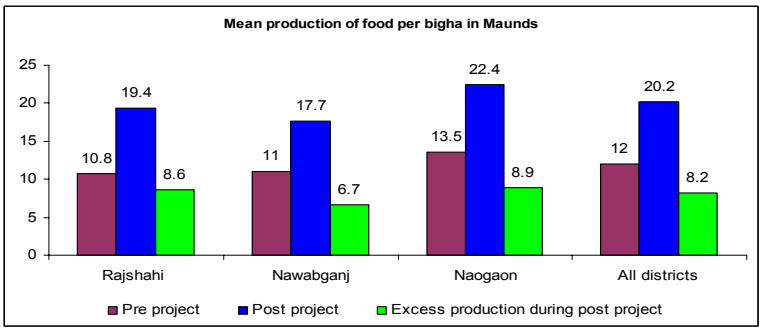
Comparatively, low effectiveness of training was observed in the following areas: proper functioning of tube well and adequate supply of irrigated water: 32%; repair of deep tube well: 9%; and preventing wastage of water: 2%. The trainees, on average, received 5 days' training. The trainees recommended on average 2 weeks' (11 days) training. 10% trainees reported that they did not understand the subject of the training due to short training period, inadequacy of practical training and difficulties to understand language; 29% of the trainees viewed that the training curricula used was not comprehensive. They recommended inclusion of additional training components in the curricula, such as rearing of domestic animals; perishing of insecticides; production of fish fry, repair and maintenance of tube well and vegetable gardening.

Measures suggested to strengthen training programs include: Repeat and refreshers' training (40%); more practical training (39%); training on modernized cultivation (28%); increased duration of training (13%); train every farmer of the village (7%); provide training allowances (4%); equip the farmers with some tools (3%); and furnish the farmers with printed materials on improved farming (3%).

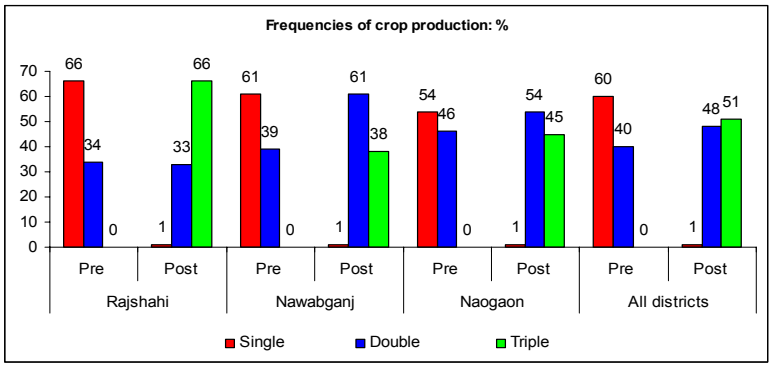
The project proposed to establish and operate 4 Nos of (1902 Sq.m) training shades (centers) with a covered area of 1902 sq. m. during the first phase; but the project established only one training shade/center covering the same covered area of 1902 sq. m. Training Center was established near Barind Head Office in Rajshahi during the 1998-99 session. Since 1999, training programs are being conducted in this building.

Agriculture Productions and Performances

Status of Food Production: Overall food production increased by 68% in all the three districts during post project period over the pre project. Bar graphs below illustrate average food production (in maunds per bigha) comparatively by pre and post project periods and by districts.

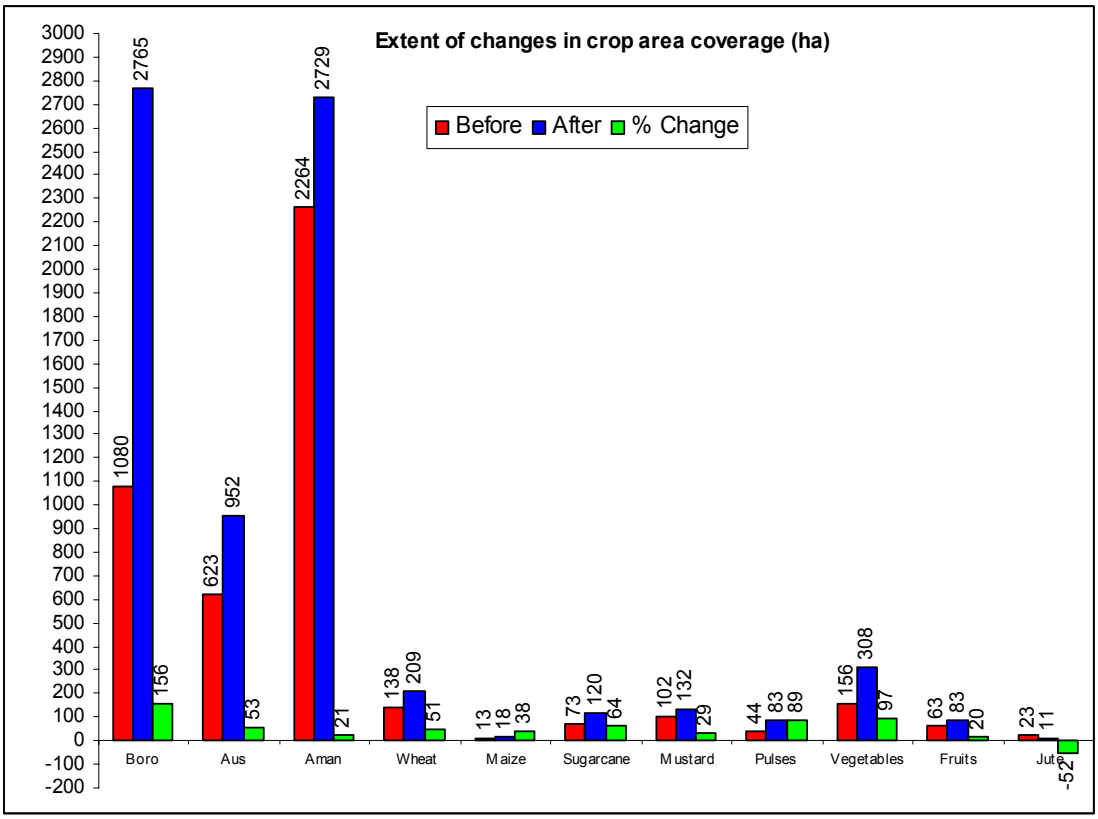


Status of Multiple Crops Production in Barind: The situations of the frequencies of crop productions improved most substantially in Rajshahi; followed by Naogaon and in Chapai Nawabganj (see bar graph).

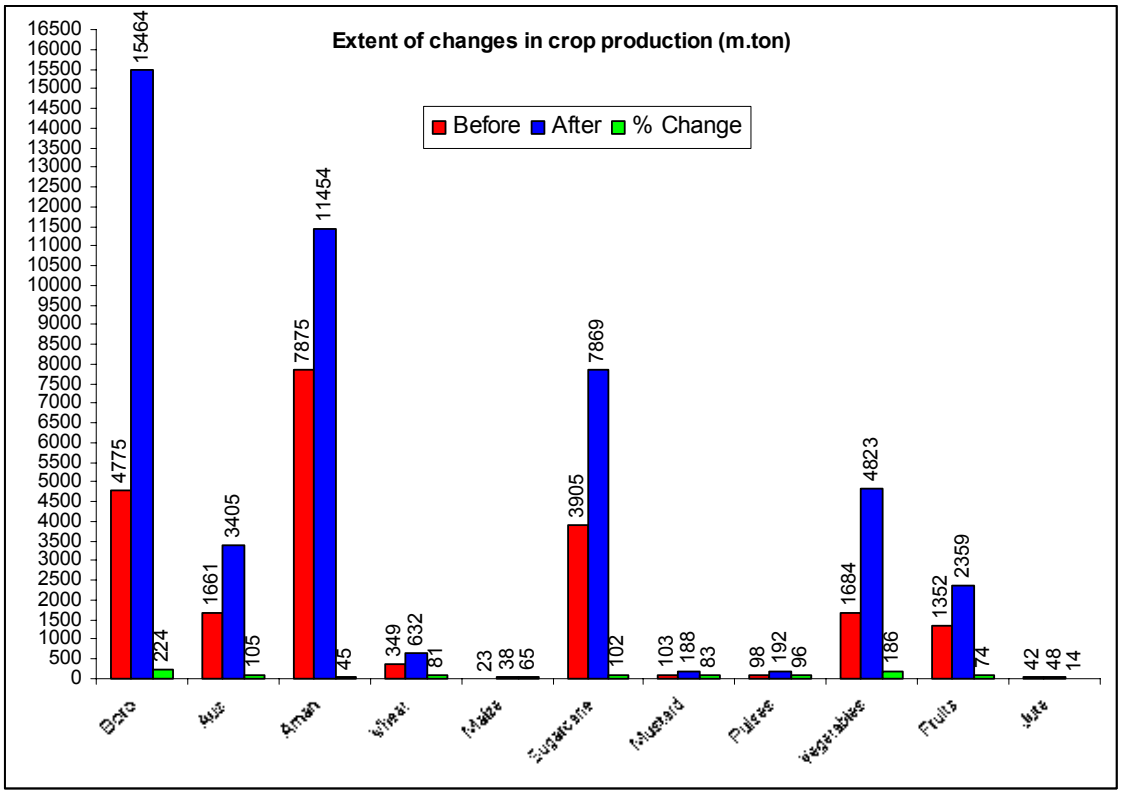


Impact on cropping intensity: The cropping intensity increased from 131% in the pre project period to 253% in the year 2009, which is higher than the DAE crop intensity level (207 -234% under 3 districts) reported in 2009.

Impact on crop area: With the increased availability of the irrigated water, the agricultural scenario fundamentally changed (coverage by types of crops):



Impact on crop production: Overall crops production increased annually (bar graphs below): and the increased scenarios are in: Boro (223.85%), Vegetables (186.40%), Aus (105%).



Fertilizer Application: The results indicate decreasing trends in the application of manures (such as cow dung, compost) after intervention of project, i.e. about 50% manure usage declined. Farmers are to be motivated for increased use of manure or compost or green manure through training. Overwhelming majority (70-95%) of the respondents used only urea before implementation of the project; but now 54-80% respondents reported that different chemical fertilizers such as Urea, TSP, MP, Zinc, Boron and mixed fertilizers are used in crop fields after implementation of the project.

Majority of the respondents (61-85%) expressed that insect and disease infestation was less at pre project implementation period. Whereas, 75-92% farmers opined that insects and disease infestation were high after implementation of the project. Insects and disease infestation continuously are increasing after intervention of project. Majority (54-84%) of farmers under three districts used less amount of pesticides in their crop fields; whereas, 61-80% of the respondents used high amount of pesticides after intervention of projects. Farmers lacked knowledge on use of non-chemical methods.

Negative environmental impacts according to the respondents (87%) were caused by reduced fertility of land, because of use of chemical fertilizers (35%); increased insect and disease infestation (28%); increased disease borne by mosquitoes/flies (20%); and pisciculture blocking open water (4%) in that order.

Socio Economic Benefits Accrued

Poverty Reduction: The mean monthly family income per household was Tk. 6102, while after project implementation, i.e., in 2009 (Year of IMED Evaluation Survey), the mean monthly family income per household increased to Tk. 9715, an additional increment of 59%, which is with inflationary effect. However, the net increase in monthly family income excluding inflation is 28%; hence the rest 31% (59%- 28%) is the impact of inflation. According to BBS Household Income and Expenditure Survey 2005 the rural monthly family income for Bangladesh is as follows:

Table 1: Estimates of net monthly family income

Year	For Rural Bangladesh (BBS) in Taka		For Barind (READ) in Taka
	Amount in Tk.	% increase over preceding year	
2009 (Estimated)	7714		9715
2005 (BBS)	6095	26.56	
2000 (BBS)	4816		

The rural average monthly family income for Barind is 26% higher than that of the rural income for Bangladesh.

Similarly, the mean monthly family expenditures per household was Tk. 4992, while after project implementation, the mean monthly family expenditures per household increased to Tk. 7691, an additional increment of 54%. Although the family income increased substantially, but the sources of income remained static reflecting that the people are benefited by the Barind interventions greatly. Increased income gains were from agriculture and farming as a consequence of the interventions. Findings show that the heads of expenditures did not change. This means that although the expenditures in terms of amount of money spent increased, but the priorities for expenditures remained unchanged. Income growth failed to induce the farm families in Barind to prioritize health and education more than before. This probably means that income increase does not automatically change people's attitudes towards the standard of living or quality of life. Without additional inducements, i.e. motivations for improving health and literacy levels, people hardly change their lifestyle. BMDA may consider launching social mobilization campaigns on improving the quality of life of the farm families, for which participation of women in Barind project in increased proportion is an imperative.

Poverty Gap: Income has increased universally, i.e., both the poor and the non poor enjoyed increased income due to Barind interventions. Poverty gap (income gap) among the poor and non poor at the pre project period was 85%, while the gap increased to 106% at post project period.

Table 2: Intra period Income (Poverty) gap by poor and non poor by districts: in %

Districts	At Pre Project Period: poor versus non poor	At Post Project Period: poor versus non poor
Rajshahi	77	106
Chapai Nawabganj	55	68
Naogaon	114	131
All 3 districts	**85**	**106**

In all the districts the rich became richer rather disproportionately meaning that the income increase is much more among the non poor compared to that among the poor at post project period. Findings on supply of irrigated water and the accompanying problems underscored the mal distribution in the supply system often influenced by rich farmers (and mastans).

Employment Opportunities: Almost universally, the male respondents in Rajshahi (98%), in Chapai Nawabganj (98%) and in Naogaon (88%) claimed that the employment opportunities increased during the Post Project Period.

Employment opportunities for Women in the Allied Sector: On average, 78% of the women of Barind claimed that they have experienced increased employment opportunities at post project implementation period in the Agriculture and its allied Sector; however such claim has been made 95% of the women in Chapai Nawabganj followed by Naogaon (74%) and in Rajshahi (71%). The median employment increase during post project period is in the six areas (Chicken/duck rearing; Vegetable garden; Agriculture; Cattle rearing; Afforestation and Fish cultivation) is 37%; again in Chapai Nawabganj, it is 43%, while in Rajshahi, it is 30% and in Naogaon, it is 24%. However, the direct participation of women in the implementation of Barind Project is as low as 2.7% only.

Recommendations: Conclusion: Sustainability

- **Study Recommendations:**
  - Increase employment and earning (wages) opportunities for women in future
  - Involve Local Administration in project operations/management
  - Extend coverage of cultivable land by underground pipes
  - Prioritize maintenance and repair of deep tube wells, irrigation channels under a comprehensive plan
  - Immediate interventions needed to prevent continuous falling of the water level in the Barind area
  - As an alternative, initiate efforts on preservation of rain water
  - Every year impart one week's training to the community farmers—males and females
  - Curricula of training to include lessons emphasizing 'proper use of irrigated water and prevention of wastage'
  - Training to focus on crop diversifications: vegetables, onion, potato

Issues of Sustainability

- **Positive Issues for Sustainability**
  - 70% of the respondents affirmed that their plots of land are covered by irrigated water
  - Wastage of irrigated water reduced by two thirds at post piped channel system
  - Most of the costs for repair and maintenance of the DTWs and the channels are borne by the beneficiaries
  - Operational status of 90% DTWs are satisfactory; similarly 82% of the buried pipe channels are satisfactory
  - Food production increased by 68% in all the three districts during post project period
- **Negative Issues for Sustainability**
  - Operational status of 57% of Pucca channels not satisfactory
  - 42% respondents claimed that repair and maintenance not done at fixed time
  - Women participation in Barind marginal and deprived of access to irrigated water

Conclusion: Barind Project is a sustainable and a successful story. Barind is also a priority program of the people. It has not only transformed their farmland from barren fields to lush green agricultural land with substantial increase in agricultural productions and in their income leading to improvements in their livelihood. But a few aspects like systematic repairs and maintenance of the irrigation structures; changing pucca or kaccha channels into buried pipes; coverage of more plots by buried pipes; reducing income gaps among the poor and non poor, and lastly encouraging more women to participate in Barind are to be ensured for more success of the project.

Chapter I
Introduction

Background of the project

Part of northern Bangladesh where climatic characteristics, topography and soil conditions are significantly different form other areas of the country is known as "Barind Tract". Total population of Barind area is about 5.6 million of whom 85% lives in the rural areas. Most of the farmers are middle class or land less. A few number of people are well to do. In actual Barind area no brick built building could be found. Earthen two storied buildings were usually found. Male to female ratio was 100: 102. The percentage of educated people varies from place to place and comparatively lower than other part of the country (Ref. 1).

All the 25 Upazilas under Rajshahi, Chapai Nawabgonj and Noagaon districts covering 0.775 million hectare of land is the territory of the project. Previously in the Project area, 40% of the irrigation water flowing through a kaccha channel were lost due to no lining and improper management of the channel. Appropriate water distribution system was needed to be designed and constructed. Since there was no provision for construction of channel covering all the Deep Tube Wells under the main project, a separate project was formulated for the remaining DTWs in the Barind.

Project Summary

Name of the Project: Barind Command Area Development and Training Project

Administrative Ministry/Division: Agriculture

Executing Agency: Barind Multipurpose Development Authority (BMDA)

Location of the Project: All the 25 Upazillas of Rajshahi, Naogaon and Chapai Nawabganj Districts

Implementation period: 1996 to 2006

Total cost: (In lakh Taka)

GOB	Total
13804.56	13804.56 (Source: IMED Evaluation Report of June, 2006)

Objectives of the project

a. The key objective of the project is to elevate the socio-economic conditions and living standards of the people in the project area through improved irrigation and water management system and imparting training to the community involved.
b. To sustain self-sufficiency in food production and to produce extra food for deficit area of the country through increasing command area of the installed deep tube wells with proper irrigation management.
c. To minimize system loss of the irrigation water and thus to achieve highest irrigation efficiency.
d. To increase the cropping intensity from 117% to 222% in DTW area following year round recommended cropping pattern through available irrigation facilities in the DTW schemes.

e. To build up a group of efficient and technical man power through intensive training regarding the activities like deep tube well operation and maintenance, irrigation and water management, construction and maintained of water control system, crop production and fertilizer use, crop diversification, afforestation, pisciculture, mechanized cultivation, electrification of small scale rural industries and maintenance & rehabilitation of rural feeder roads.
f. To create additional job opportunity for the small and marginal farmers and the day laborers.

Evaluation Objectives (as per ToR)

To review the implementation status of the following components of the project:

a. Construction works of the channel/water distribution system;
b. Construction works of training shades/centres & training programs conducted;
c. Repair and maintenance of channel/water distribution system;
d. Procurement of office and field equipment.

To assess the impact of the following components of the project after implementation:

a. Self-sufficiency of the beneficiaries in food production;
b. Increase the cropping intensity;
c. Additional job opportunity created for the farmers, day labourers and women;
d. Skill and efficiency of trainees;
e. Socio-economic development and standard of living of the beneficiaries;
f. Impact on environment; and
g. Sustainability of the project

Chapter II
Methodology and Sampling

The methodologies of the Impact Evaluation study comprised both quantitative survey and qualitative in-depth investigations. Quantitative household survey was conducted to measure impact of water infrastructures on water use efficiency (reducing system loss), accelerating agricultural production, creating job opportunities, pursuing socio-economic development, improving standard of living of the beneficiaries (primarily middle and landless farmers), impact on environment, and sustainability of the project. Qualitative in-depth investigations covered physical verifications of water channels, intensive interviews with the key informants from among the trainees and also from the project personnel (officials and field workers).

Impact Assessment

To assess the impact of the project interventions following specific methods were applied.

- Obtained data on time scale that is asked the respondents to give estimates on their benefits gained (agricultural production, income generation and improved standard of living) both currently and retroactively. Currently refers to about a year around data collection, while the previous period refers to five years before data collection. Besides relying on recollection by the respondents, the study also compared and matched data sifted from records relevant to pre and post project status, particularly on data related to agricultural production; and

- Created statistical control groups (samples) using the data from the intervention areas, where unions with relatively better performing (having **more** than average levels of coverage of hectares of land by irrigated water) and those less performing (having **less** than average levels of coverage of hectares of land by irrigated water).

Sampling and sample size for Quantitative Survey

A two-stage stratified sampling procedure was applied to select the sample. At the first stage Primary Sampling Unit (PSU: village) was selected. PSU was within 2 km of the implemented project area. Second stage, households were selected from each PSU. The size of the sample was sufficient. Sample size was determined on the following criteria:

- The confidence and precision desired;
- The variability of the characteristics of the target population if unknown (one must assume greater variability); and
- The size of the target population

The sample size with a given degree of accuracy at a given level of statistical significance was estimated using the following formula,

$n= [z^2 p (1-p)]/[d^2]$

Where n= the desired sample size

Z= the standard normal deviate, usually set at 1.96 at 5% level which corresponds to 95% confidence level;

p= expected prevalence=50% (p=0.50)

The degree of accuracy or precision level is d which is considered at 10%

The higher value of d will yield lower sample size and smaller value of d will yield higher sample size.

Suppose 50% of the households improve their living standard after implementation of the project. z statistic is 1.96, which corresponds to the 95% confidence level. d is the level of accuracy that is considered 10%. Putting values in the above formula, we get sample size n = 97. We considered 100 households per PSU.

A total of 48 PSUs were selected from 25 upazillas. So, total sample households were 100x 48= 4800. From each Upazila 2 Unions and from each Union, 2 Villages were selected randomly. Of the 48 PSUs (Villages), 50% were with coverage of agricultural land above average (high performing), while 50% were below average (low performing) by the irrigated water (Water channels).

Selection of Upazilas, Unions, Village and Households

A random sample of 12 Upazilas (4 in Rajshai, 3 in Chapai Nawabganj and 5 in Naogaon District) were selected from 25 upazilas. From each selected Upazila, 2 Unions and from each selected Union, 2 villages and from each village, 100 households were selected randomly. Total sample spots were:

- Total districts = 3
- Total Upazilas= 12
- Total Unions = 24
- Total Villages = 48
- Total households = 4800
- Total respondents = 6000 (male=4800;female=1200)

Selection of respondents at household level: All the households were selected using systematic random sampling. From each selected household (middle and landless farmer)

one adult male preferably head of household was interviewed. In addition, from every fourth household, a married woman (preferably wife of the male respondent) was also interviewed regarding their food production, consumption and other aspects of life. Random selection ensured distribution of households by poor and non poor proportions.

Sample for Qualitative Investigations: For Water Channel/Water Distribution System and Training Centers Observation and in-depth Interviews of Key Informants

- Physically Check 48 Deep Tube Wells (one per village: PSU) connecting both piped channels and pucca channels (where available);
- Physically check the training centers ;
- Intensive interviews with trainees; and
- Intensive interviews with personnel at Upazillas, Districts and at the BMDA HQ levels.

In addition to above, a local level Stakeholders' Workshop was conducted in Puthia Upazilla, Rajshahi District to elicit opinions and reviews of project performance by the key informants and influential living within the project area. Table 1 shows distribution of sample spots in details.

Table 1. Distribution of sample Districts, Upazilas, Unions, Deep Tube Wells, Irrigation Channels and Coverage of Farm Land

Name of Districts	Name of Upazillas	Name of Unions	Number of Deep Tube Well per Union	Type of channels per Union	Number of Deep Tube Well per Upazilla	Type of channels per Upazilla	Area coverage (Bigha) Per Union	Total Area (Bigha) Per Upazila	Irrigation area coverage (Bigha) per Upazila
1. Rajshahi	1.Godagari	1. Gogram	108	Buried pipe: 103 Pucca:5	312	Buried pipe: 290	17928	143800	114235
		2. Godagari Pouroshova	9	Buried pipe: 9 Pucca:0		Pucca: 22	1494		
	2.Mohanpur	3. Jahanabad	28	Buried pipe: 22 Pucca:6	130	Buried pipe: 100	4984	142618	53953
		4. Ghasigram	12	Buried pipe: 8 Pucca:4:		Pucca: 30	2136		
	3.Puthia	5. Shilmaria	30	Buried pipe: 20 Pucca:10	48	Buried pipe: 32	4410	80782	17756
		6. Geupara	4	Buried pipe: 1 Pucca:3		Pucca: 14	588		
	4.Charghat	7. Nimpara	5	Buried pipe: 3 Pucca:2	13	Buried pipe: 5	500	46376	1280
		8. Charghat	6	Buried pipe: 3 Pucca:3		Pucca: 8	480		

Name of Districts	Name of Upazillas	Name of Unions	Number of Deep Tube Well per Union	Type of channels per Union	Number of Deep Tube Well per Upazilla	Type of channels per Upazilla	Area coverage (Bigha) Per Union	Total Area (Bigha) Per Upazila	Irrigation area coverage (Bigha) per Upazila
2. Chapai Nawabganj	5.Chapai Nawabganj	9. Jhilim	30	Buried pipe: 24 Pucca:6	62	Buried pipe: 41	5220	72732	33355
		10. Baliadanga	14	Buried pipe: 13 Pucca:1		Pucca: 21	2436		
	6.Gomostapur	11. Radhanagar	60	Buried pipe:54 Pucca:6	117	Buried pipe: 92	9660	150403	56687
		12. Rahanpur	7	Buried pipe: 2 Pucca:5		Pucca: 25	1127		
	7.Nachol	13. Fateypur	123	Buried pipe: 113 Pucca:10	160	Buried pipe: 146	21402	125685	82500
		14. Nijampur	4	Buried pipe: 3 Pucca:1		Pucca: 14	696		
3. Naogaon	8.Mohadevpur	15. Mohadevpur	13	Buried pipe: 5 Pucca:8	130	Buried pipe: 92	2743	317257	107011
		16. Vimpur	8	Buried pipe: 4 Pucca:4		Pacca: 38	1600		
	9.Badalgachi	17. Paharpur	48	Buried pipe: 46 Pucca:2	82	Buried pipe: 70	9408	217116	47440
		18. Bilashbari	4	Buried pipe: 3 Pucca: 1		Pucca: 12	784		
	10.Sapahar	19. Goala	76	Buried pipe: 71 Pucca:5	280	Buried pipe: 235	12692	155242	44834
		20. Sapahar	7	Buried pipe: 7 Pucca:0		Pucca: 45	1169		
	11.Porsha	21. Mushidpur	92	Buried pipe: 75 Pucca:17	210 (263 DTW)	Buried pipe: 172	20240	135283	33442
		22. Nitpur	41	Buried pipe: 35 Pucca:6		Pucca: 38	9020		
	12.Niamatpur	23. Paroil	100	Buried pipe: 95 Pucca:5	194	Buried pipe: 159	14100	152057	78249
		24. Hajinagar	4	Buried pipe: 2 Pucca:2		Pucca: 35	564		

Chapter III
Data Collection

Study Implementation Strategies

The study was implemented in 3 Districts, 12 Upazillas, 24 unions and 48 villages covering 6000 respondents in 4800 households applying both quantitative survey and qualitative in-depth investigations. The study was implemented in the following three broad phases: **Preparatory Phase; Field Data Collection Phase; and Data Consolidation and Report Phase.**

Data Collection: Methods

Development of Data Collection Tools: Seven different types of data collection instruments were developed for the study:

- A pre-coded structured and Standardized Questionnaires for Household Survey for Adult males and females;
- Semi-structured open ended questionnaires for Intensive Interviews with Trainees;
- Semi-structured open ended questionnaires for Intensive Interviews with BMDA and allied department officials at Upazilla level;
- Semi-structured open ended questionnaires for Intensive Interviews with BMDA and allied department officials at District level;
- Checklist for Observations by Physical Verifications of Piped and Pucca irrigation channels connected with 48 DTWs, one per village;
- Checklist for Observations and Physical Verifications of Training Centers; and
- Checklist for Assessment of conducted training programs.

Recruitment of Survey Manpower: In total 46 eligible survey manpower, both males and females were recruited by READ for data collection. The recruitment criteria included their educational background, ability to interact with people, willingness to stay in the field and previous experience in other surveys. The distribution of recruited manpower for field data collection for the survey was as follows:

- Interviewers — 39
- Sr. Investigators— 4
- Field Supervisors— 3 (one per team)

Training of Survey Manpower: All the recruited manpower for field investigation was trained for 5 days (including field practice combined with pre-testing of data collection instruments) that started on 11th October, 2009 and ended by 15th October, 2009. The training was conducted in a participatory method and all the trainees participated actively in different sessions. The training program was conducted by the resource persons of READ and was enriched by active participation of DG and the concerned IMED officials along with experts and concerned officials of BMDA. The Principal Investigator of the study constantly supervised all the sessions to ensure quality of the training.

Pre-testing and Finalization of Data Collection Tools: During the training of the Field Investigators, 1 field visit was performed for field practice combined with pre-testing of the questionnaires under intensive supervision. The field visit was conducted at Kulla Union of Dhamrai Upazilla of Dhaka district on 13th October 2009. During the field tests, all different types of questionnaires were completed several times by the Field Investigators. After the field practice, a whole day training session was held for review of field experiences. Based

on the observations in the field practice and suggestions made by the team and concerned personnel of IMED, data collection tools were further modified and finalized.

Collection of data from field: After completion of the training program all the field personnel involved with the study were briefed about their field assignment and overall management of data collection activities. Three teams were formed to cover the 3 districts for survey purposes. A well designed field movement plan for effective implementation of the survey was developed and all the team members were briefed about the advance field action plan properly. Prior to study in the field, necessary request letters from the concerned agency (IMED) were obtained to elicit cooperation from the field offices of the respective agencies. Data collection activities at the field level commenced on 18th October, 2009 and ended by 16th November, 2009.

Monitoring, Supervision and Quality Control: Each Field team was guided and managed by a Field Supervisor, who regularly maintained contacts with the Co-Team Leader in READ office to report on day to day basis on the progress of data collection. The field supervisor in each team was responsible for ensuring supervision and management of each team at the field level by assigning and taking stock of team's day's work by individual interviewers. They arranged accommodation, coordinated with local influential and maintained regular liaison with READ office at Dhaka. The Field Supervisors in addition to their functions of supervision and field management ensured quality control checks through random interviews. The distribution of targeted and completed interviews of both quantitative survey and qualitative investigations is shown in the table below:

Table 2: Distribution of targeted and completed survey data collection of both quantitative and qualitative investigations

Data collection methods & Category of Respondents	Sample Size		% Completed
	Target	Completed	
➢ **Quantitative Survey/Investigations**			
• Male Adult Respondents: Head of the Household (middle and landless farmers)	4800	4800	100
• Female Adult Respondent	1200	1200	100
Total interviews at household level	**6000**	**6000**	**100**
➢ **Qualitative Investigations**			
• Intensive interviews with Trainees	192	182	94
• Intensive interviews with project personnel at Upazillas, Districts and BMDA HQ. level	100	94	94
➢ **Observations and Physical Verifications**			
• 48 Deep Tube Wells connected with Piped and Pucca Channels	29,280 meters	30,176 meters	103
• Construction works of Training shades/centers: although the target was 4, but during project period only one shade/center was established spending the money for the 4 centers	1	1	100
• Conducted Training Programs: As project was completed in 2006; hence it was not possible to observe an on-going training program for that period; however, we observed one training program that was being conducted under the current extended project (phase 2)			

Chapter IV
Data Analyses: Findings

Data collection and data consolidation occurred simultaneously. Completed interview schedules were brought to READ office Dhaka phase by phases for thorough editing and for data processing. Data consolidation activities, such as editing, coding, translating, classifying and data entry into the computer software for analysis were carried out simultaneously. Frequency tables (one, two or multiple ways) were prepared for interpretations and analyses using SPSS and d-Base, EPI soft wares, Fox pro) for data analyses. Data analyses and the findings are presented comparing by districts, pre and post periods and high and low performing areas, where relevant. Findings from quantitative survey and qualitative investigations are integrated and are presented in the following broad sections commensurate to ToR objectives:

Section 1: Sample Characteristics
Section 2: Irrigation System: Operational Efficiencies
Section 3: Repair and Maintenance
Section 4: Management Committees
Section 5: Training Assessments: Coverage, Performance, Institutions
Section 6: Agriculture Productions and Performances
Section 7: Intensive Interviews with personnel of BMDA & Allied Organizations
Section 8: Assessment of Infrastructure: Findings of Observation of Irrigation Channel (Buried pipe and Pucca)
Section 9: Local level Workshop
Section 10: Socio Economic Benefits Accrued

Section 1: Sample Characteristics

Socio-demographic and Economic Data

Male Adult Farmers: Respondents

The mean age of the male adult farmers is 42 years; the mean age by districts varies by only 1-2 years: Rajshahi: 41 years; Chapai Nawabganj: 44 years and Naogaon: 40 years. Mean level of education completed is 4th grade for Rajshahi, 3rd grade for Chapai Nawabganj and 5th for Naogaon. Almost all the respondents (99%) are currently married. And the mean family size is 6 and 27% of the families are joint families. Ninety six percent of the male respondents are engaged in farming both before and after project implementation.

Female Respondents: Including Female Adult Farmers

The mean age of the adult females is 33 years, which differ slightly by districts by 1-2 years. By educational qualifications, adult females are 4th grade qualified on average. Before the project overwhelming majority (95%) of the adult females were housewives, student (2%) and only 4% were engaged in income earning occupations: vegetable gardening (1%), duck and poultry rearing (2%) and teacher (1%). After the project primary occupations of the adult females are housewives (92%) and only 8% are engaged in some income earning occupations like vegetable gardening (2%), agriculture (2%), duck and poultry rearing (2%), tailor (1%) and teacher (1%).

Before project average monthly income of the adult females was Tk. 453, and after the project the current average monthly income of the adult females is Tk. 880, an additional increment of 94%.

Section 2: Irrigation System: Operational Efficiencies

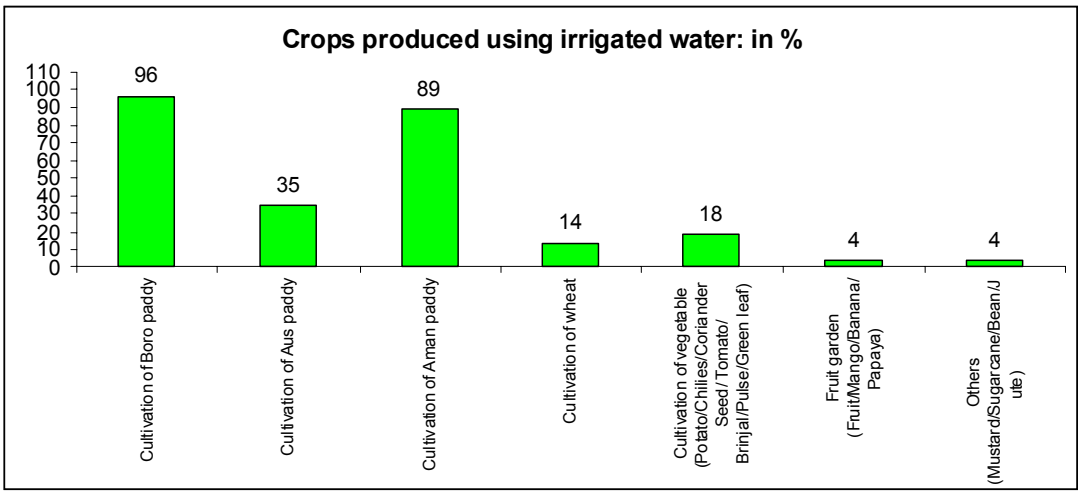
Awareness, Participation, Charges and payments for irrigated water:

Majority of the respondents (80%) were aware about Barind project. Although 68% of the farmers mentioned that local committees were formed; but overwhelming majority of the respondents (91%) did not participate in the project. Of the 9% farmers who claimed to have participated in the project (contributed labor or in the committee) opined that the participation of the women was almost nil or very meager (2.7%). Reasons for low participation of women during project implementation are:

- Contractors hired non-locals as labourers for construction;
- Installation for irrigation work was sometimes carried out at night; and
- Lack of adequate social mobilization inducing participation of the locals, both men and women in project implementation activities.

Surprisingly, 98% of the farmers did not experience any problem related to the project or its effects. Again overwhelming (81%) majority certified that the construction of the channels were proper. The charges for irrigated water range between Tk. 60 to 100 per hour and most of the times the payments are made in cash (83%).

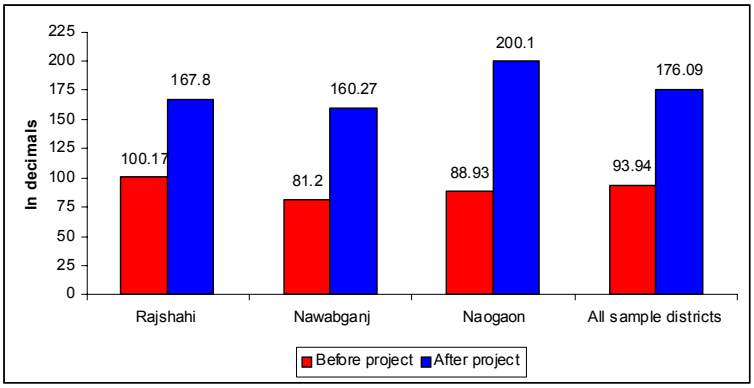
There are currently on average 4 Deep Tube Wells (DTWs) per village; the number of DTWs per village by the high and low performing areas vary by one, i.e., high performing areas have one DTW more than that in the low performing areas. All the (mean number) established DTWs found currently are also in operational conditions. However, in some villages, very few DTWs were found non functional and the reasons found were: meter not functional; water layer too low and absence of electricity. All the DTWs are connected by Piped (71%) and Pucca Channels (29%). The average lengths in meter of the piped channels are 614 and that of pucca is 606. Hundred percent of the farmers (respondents) use the irrigated water (either form piped or from pucca channels) for farming. Irrigated water is used for production of Highbrid (9%), HYV (74%) and local varieties (17%). The varieties of crops produced using the irrigated water are shown in the bar graphs below:



It is important to determine the location of the plots of land, because the plots, which are adjacent or very close to the channel irrigating water are likely to be irrigated well; those which are at some or further distance are likely to receive irrigated water possibly with interruptions (in terms of flow of water from the channel to the plots). The findings on location of the plots show that 49% either adjacent or very near to the irrigated channels; 36% of the plots are too far away (probably at the end of the plots served from an irrigating channel), while 15% fall at the middle section.

Coverage of irrigated land (in decimal)

More than two thirds (70%) of the respondents affirmed that their plots of land are irrigated by water from Deep Tube Wells (DTWs): Chapai Nawabganj (81%), Rajshahi (67%) and Naogaon (62%). Bar graphs illustrates the coverage of land per family by irrigated water from the DTWs by Districts both pre and post project implementation periods:

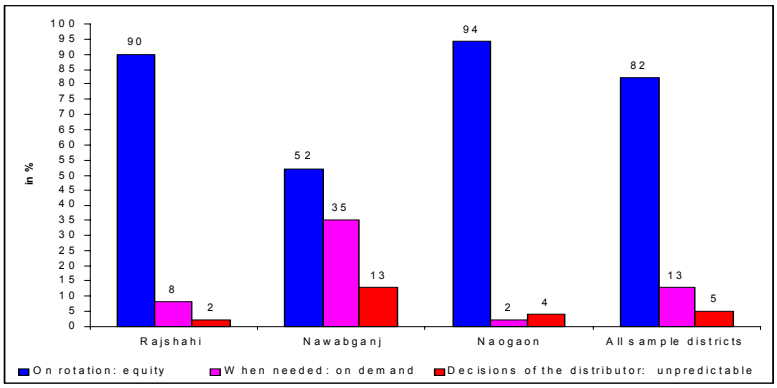


The proportional improvements in the coverage of irrigated land during post project over the pre project implementation are:

- In Naogaon, from pre project (88.93 decimals) to post project (200.1 decimals), which is an improvement by additional 56%;
- In Chapai Nawabganj, from pre project (81.2 decimals) to post project 160.27 decimals), which is an improvement by additional 49%; and
- In Rajshahi, from pre project (101.17 decimals) to post project 167.8 decimals), which is an improvement by additional 40%.

Availability of irrigated water in the farming plots is a vital status for the plot being productive. And availability is conditioned by three factors, all influenced by human practices. When water is distributed to all the lands on rotation, i.e., on equity basis, it is considered the most effective distribution system; the next alternative is when the water is not available automatically but on demand and the worst situation is when water is made available only at the sole decisions of the authority (Distributor) controlling the system. In this perspective, the farmers from both Rajshahi and Naogaon enjoy privileged status, as in these places, more than 80% said that irrigated water is distributed on rotation (on equity); only 13% said that they received it on demand (when necessary) and only about 5% said that it depended on the decisions of the distributors. But the scenario in Chapai Nawabganj is quite different, where only 52% said that irrigated water is distributed on rotation, 35% on demand and 13% on the decisions of the distributors (See bar graph below).

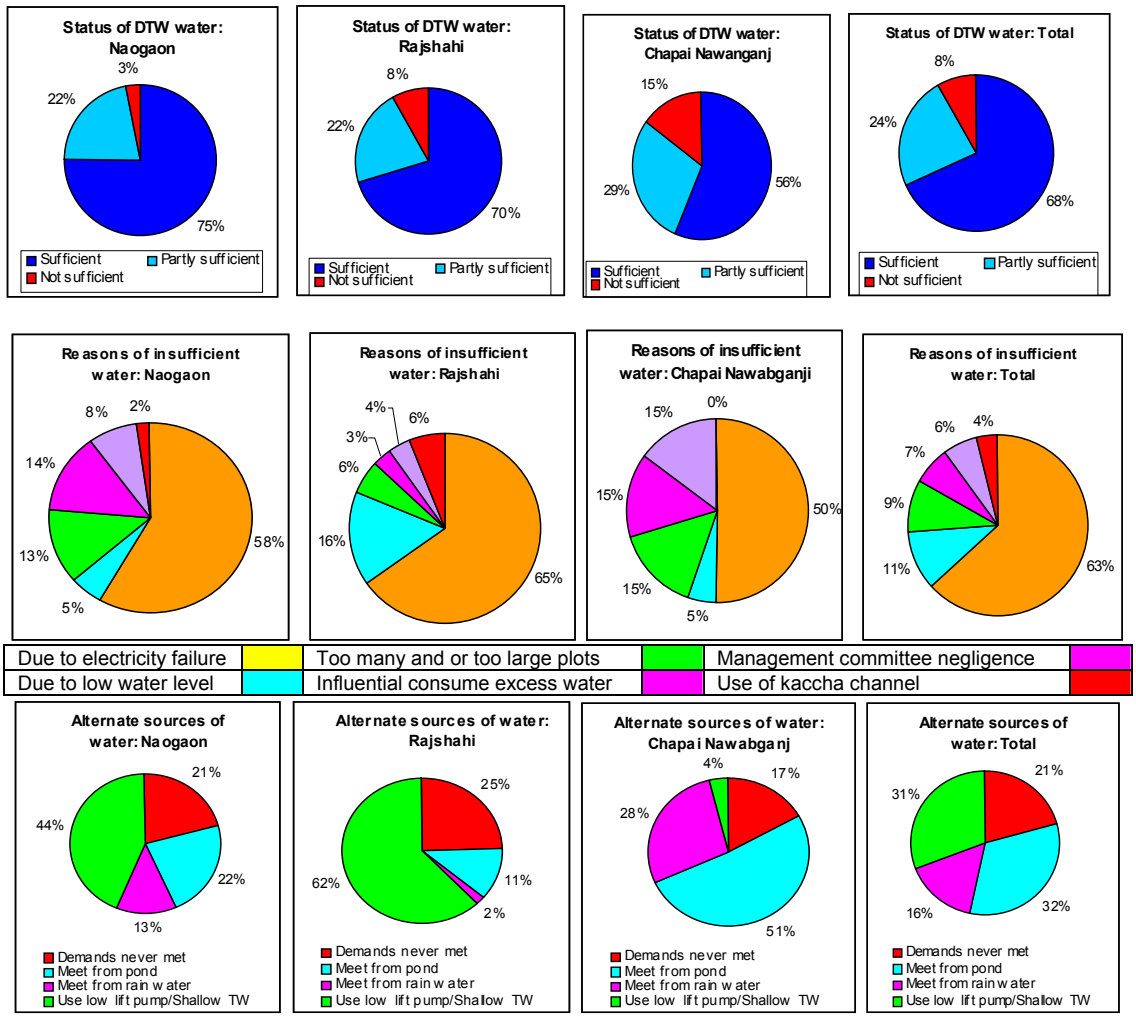
Perception on irrigated water distribution practices (system): in %



Status of use of Deep Tube Well Water

Pie charts below illustrate the status of availability of Deep Tube Well (DTWs) water for Irrigation with corresponding reasons for non availability and the status of meeting the needs of water for irrigation from alternative sources by districts. By overall assessment for all three districts 92% beneficiaries use DTWs water for irrigation sufficiently or partially. Comparatively assessing the status of availability of water sufficiently or partially, the situation in Naogaon (97%) is the best followed by Rajshahi (92%) and next Chapai Nawabganj (85%).

Pie charts on Status of DTW water for irrigation and reasons of insufficiency & alternate sources : in %

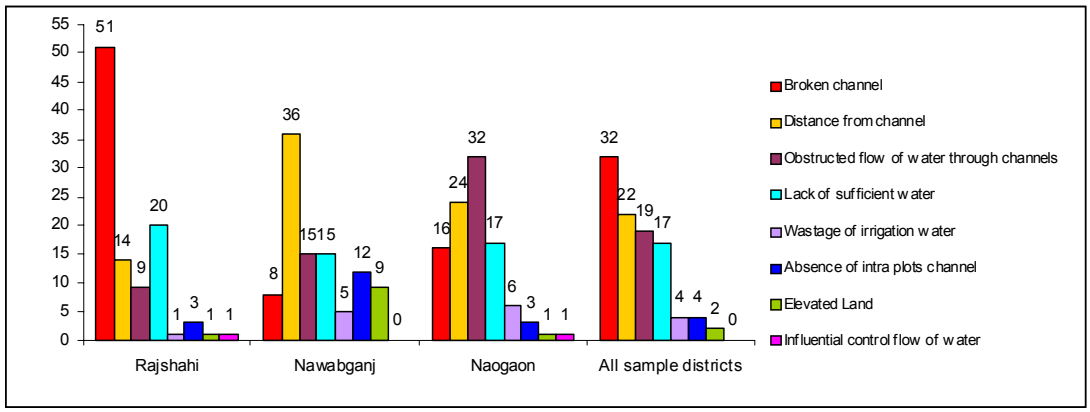


Insufficiency of DTW water is experienced primarily due to lack of uninterrupted supply of electricity: Naogaon (58%), Rajshahi (65%), and Chapai Nawabganj (50%). The other reasons for shortfall of DTW water vary by districts:

- Naogaon: Influential farmers consuming excess water (14%); cover too many/large plots (13%); defaults of MC (8%);
- Rajshahi: Low level of water (16%); cover too many/large plots (6%); use of Kaccha channel (6%); and
- Chapai Nawabganj: Negligence of MC (15%); cover too many/large plots (15%); Influential consuming excess water (15%).

Problems experienced of water channels: Piped/Pucca

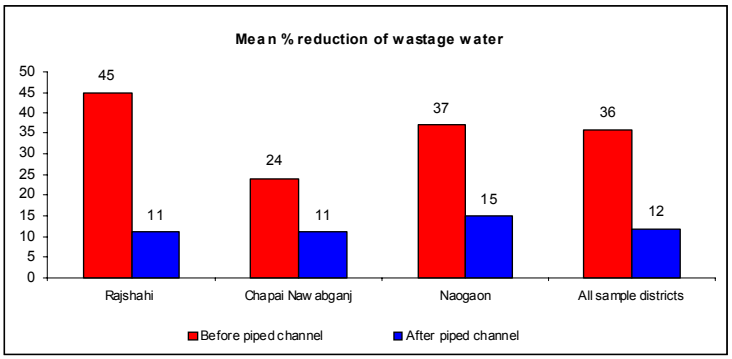
About ninety percent of the respondents did not face any problem related to channels (piped/pucca): Chapai Nawabganj (94%), Naogaon (89%), and Rajshahi (84%) and the reasons or specific problems are as follows (see bar graph)



- In Rajshahi the major problem is the broken status of the channel (51%), followed by lack of sufficient supply of water in the channel (20%); and distance of the plot from the channel (14%);
- In Chapai Nawabgnaj the major problem related to channels is the distance of the plot from the channel (36%); followed by lack of sufficient supply of water in the channel (15%) and obstructed flow of water through channels (15%); and
- In Naogaon the major problem related to channels is the obstructed flow of water through channels (32%); followed by distance of the plot from the channel (24%); lack of sufficient supply of water in the channel (17%) and the broken status of the channel (16%).

Reduction of Wastage of Irrigated Water:

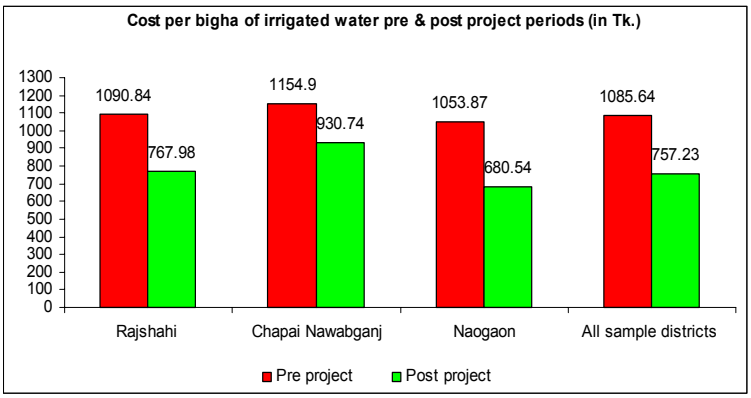
Over ninety percent of the respondents irrespective of districts and high and low performing unions claimed that, the level of wastage of water reduced substantially after establishment of the piped channel system. The bar graphs below illustrate proportion of wastage at pre and post piped channel systems comparatively.



The mean reduction of the wastage of irrigated water was reduced by two thirds at post piped channel system compared to previous kaccha channel system. The highest reduction has occurred at Rajshahi (34%); followed by Naogaon (22%) and Chapai Nawabganj it is only 13%. One of the important reasons for comparatively low proportion of reduction of wastage of water in Chapai Nawabganj is lack of awareness on the need for reducing

wastage (27%), while in Rajshahi and in Naogaon it is due to water being transferred to other lands 28% and 16% respectively, while other major reason is existence of the kaccha channel.

Majority of the respondents (58%) claimed that the cost per unit (bigha) of irrigating water has reduced during post project implementation period compared to pre project implementation. The bar graphs below illustrate the comparative cost reduction.

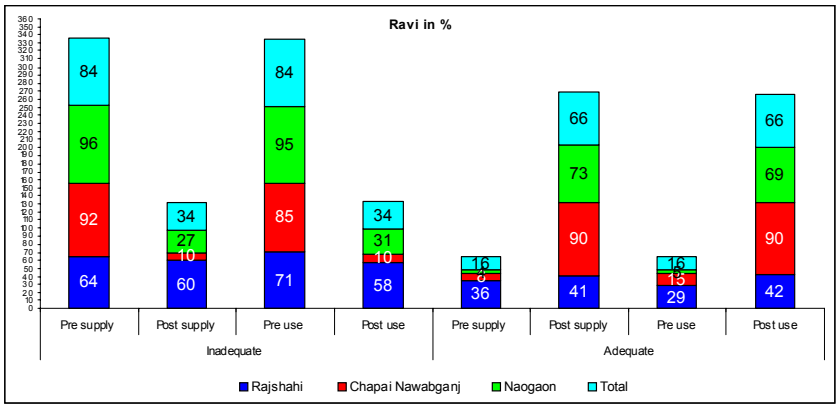


In the overall, the reduction of the costs for irrigated water per bigha is Tk 328 (30%) comparatively at post project implementation period over the pre project; however, the highest reduction of the costs have been experienced in Naogaon Tk. 373 (35%) followed by Rajshahi Tk. 322 (30%) and Chapai Nawabganj Tk. 224 (19%).

Supply and use of irrigated water

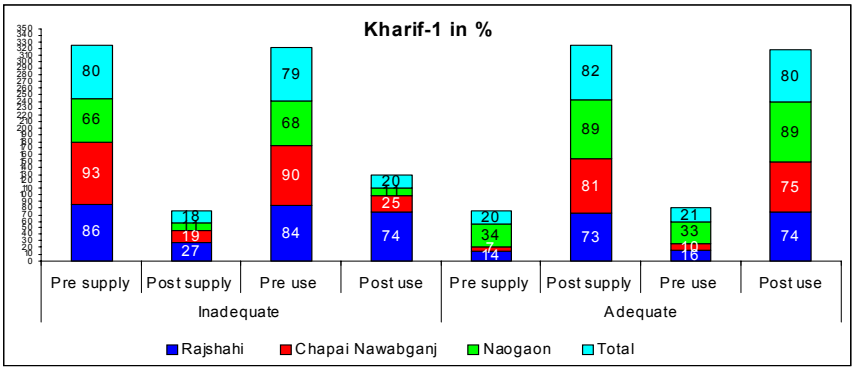
The level of supply and use of irrigated water has been discussed in the presentations below comparatively by districts, pre and post project periods, by seasons, and by types of crops:

- **Rabi Season: Kartik - Falgun or from 16th October to 15th March**
  - In Rajshahi: The supply of irrigated water was adequate at pre and post project periods respectively at 36% and 41%; while the level of use was adequate at 29% and 42%;
  - In Chapai Nawabganj: The supply of irrigated water was adequate at pre and post project periods respectively at 8% and 90%; while the level of use was adequate at 15% and 90%; and
  - In Naogaon: The supply of irrigated water was adequate at pre and post project periods respectively at 4% and 73%; while the level of use was adequate at 5% and 69%.



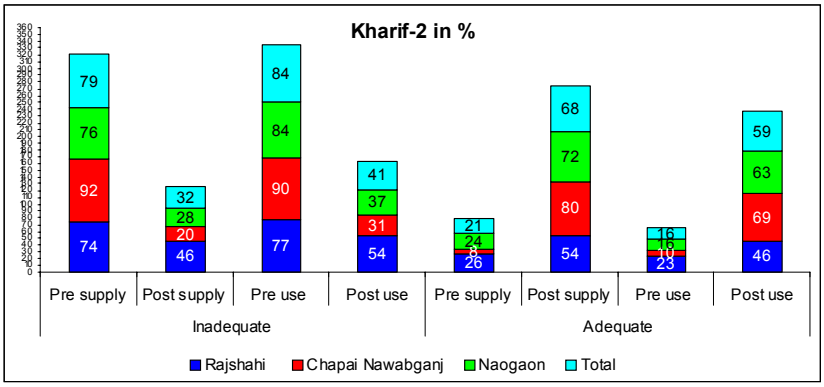
➢ **Kharif-1 Season: Chaitra - Ashar or from 16th March to 15th July**

- In Rajshahi: The supply of irrigated water was adequate at pre and post project periods respectively at 14% and 73%; while the level of use was adequate at 16% and 74%; In Chapai Nawabganj: The supply of irrigated water was adequate at pre and post project periods respectively at 7% and 81%; while the level of use was adequate at 10% and 75%;
- In Naogaon: The supply of irrigated water was adequate at pre and post project periods respectively at 34% and 89%; while the level of use was adequate at 33% and 89%;



➢ **Kharif-2 Season: Srabon - Ashin or from 16th July to 15th October**

- In Rajshahi: The supply of irrigated water was adequate at pre and post project periods respectively at 26% and 54%; while the level of use was adequate at 23% and 46%; In Chapai Nawabganj: The supply of irrigated water was adequate at pre and post project periods respectively at 8% and 80%; while the level of use was adequate at 10% and 69%;
- In Naogaon: The supply of irrigated water was adequate at pre and post project periods respectively at 24% and 72%; while the level of use was adequate at 16% and 63%;



As regards both supply and use of the irrigated water during post project periods in all the three seasons/crops (Rabi, Kharif-1 and Kharif -2), the status of both Naogaon and Chapai Nawabganj remains better than the average level of the three districts combined, while that of Rajshahi falls below the average of the three districts.

Section 3: Repair and Maintenance

All the DTWs (48 one per village) investigated are connected by Piped (71%) and Pucca Channels (29%). The average length in meter of the piped channels is 614 and that of pucca is 606. In total, the current study has physically verified 29409 meters of channels (additional 896 meters verified), of which 20925 meters are piped channels and 8484 are pucca channels. Current status of the three structures, such as Deep Tube Wells (DTWs), Piped and Pucca channels are shown in Table 3.

Table 3: Respondent's opinion on the current status of the irrigation structures: in %

Status	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Deep tube-well				
Satisfactory	91	89	91	91
Unsatisfactory	9	11	9	9
Buried Pipe Irrigation Channel				
Satisfactory	88	86	78	82
Unsatisfactory	12	14	22	18
Pucca Irrigation Channel				
Satisfactory	30	51	45	43
Unsatisfactory	70	49	55	57

Ninety one percent of the DTWs are found satisfactory; similarly 82% of the buried pipe channels were found satisfactory, but only less than half of the pucca channels (43%) was found satisfactory. As regards pucca channels, the conditions are worse in Rajshahi (70% unsatisfactory); while in Naogaon and in Chapai Nawabganj roughly 50% are satisfactory or unsatisfactory. About a fifth of the Piped channels (22%) in Naogaon was found unsatisfactory.

Survey findings show that the functions of repair and maintenance of the irrigation installations were discharged by the Care Takers, BMDA persons and by the beneficiary themselves.

Table 4: Respondent's opinion on the current responsibilities of repair and maintenance the irrigation structures: in %

Maintenance authority/person	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Deep Tube-well				
Care taker	88	51	85	78
BMDA	14	36	21	22
Beneficiaries	5	14	1	6
Buried Pipe/ Pucca Irrigation Channel				
Care taker	89	51	92	81
BMDA	9	32	11	16
Beneficiaries	9	17	3	9

Both in Rajshahi and in Naogaon, the Care Takers performed most (85 to 92%) of the functions of repairs and maintenance of both DTWs and Piped/Pucca channels, but in Chapai Nawabganj, the Care Takers barely performed more than half (51%) of the functions, while BMDA persons performed one third of the functions.

Most of the costs for repair and maintenance of the DTWs and the channels are borne by the beneficiaries: 60% in respect of DTWs and 62% in respect of the channels. But in

Naogaon, the costs of repair and maintenance of the DTWs are shared almost equally: Beneficiaries—37%; Care Takers—45%; and BMDA—34%.

The Care Takers and BMDA share the costs of the repair and maintenance of DTWs around 28% and 23% respectively. Similarly as regards the costs of the repair and maintenance of the channels the Care Takers and BMDA share the costs to the extent of 29% and 16% respectively. In Naogaon the costs of the repair and maintenance of the channels are again shared comparably: Beneficiaries—39%; Care Takers—49%; and BMDA—25%.

Table 5: Respondent's opinion on bearing the costs of repair and maintenance of deep tube-well, buried pipe/ pucca irrigation channel: in %

Persons bearing Costs of repair and maintenance	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Deep Tube-well				
Beneficiaries	66	89	37	60
Care taker	26	1	45	28
BMDA	18	10	34	23
Buried Pipe/ Pucca Irrigation Channel				
Beneficiaries	72	89	39	62
Care taker	26	1	49	29
BMDA	8	9	25	16

A bare majority of the respondents claimed that the repair and maintenance works of the DTWs are done at an appropriate time, i.e. before on set of the cropping seasons/ on the eve of using water (58%), but nearly half of them (42%) claimed that for the repair and maintenance, there is no fixed time, it is done year-round.

Table 6: Respondent's opinion on the timing of repair and maintenance of deep tube-well, buried pipe/pucca irrigation channels: in %

Maintenance period	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Deep Tube-well				
At appropriate Time: Before on set of the cropping seasons/ On the eve of using water	55	70	53	58
No fixed time/ Round the year	45	30	47	42
Total	100	100	100	100
Burried Pipe/ Pucca Irrigation Channel				
At appropriate Time: Before on set of the cropping seasons/ On the eve of using water	69	72	54	64
No fixed time/ Round the year	31	28	46	36
Total	100	100	100	100

As regards the channels (piped and pucca), nearly two thirds (64%) of the respondents claimed that the repair and maintenance works are carried out at an appropriate time, but a third of them (36%) claimed that there is no fixed time for the same.

Section 4: Management Committees

At the local level, Water Management Committee (WMC: Scheme Committee) comprises beneficiary representatives, care takers/operators, drain man, and representative of BMDA (when available). About three fourths (72%) in Rajshahi, less than half in both Chapai Nawabganj (46%) and in Naogaon (43%) are aware of the WMCs.

Table 7: Responsibilities & functions of water supply, use and management committees: in %

Types of activities performed by WMCs	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Supply and Distribution of Water (solving problems) in the village	29	36	81	50
Provide Advice and Assist: on proper use of water	64	21	24	41
Maintenance and repair of deep Tube-well and irrigation channels	27	68	19	33
Provide training	2	2	2	1
Do nothing	1	4	0	5

Table 8: Level of satisfaction on the performances of Water Management Committees: in %

Satisfaction level	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Very satisfied or just satisfied	55	56	65	58
Partly satisfied	36	41	32	36
Not satisfied	9	3	3	6
Total	100	100	100	100

Combined analyses of job performances (Table 7) and the level of satisfactions, as these are somewhat related, are:

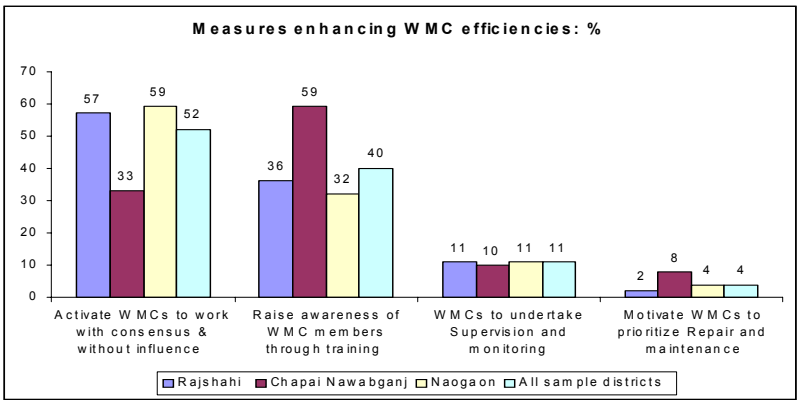
- In Rajshahi about two thirds of the respondents (64%) said that the WMCs provide advice or assist in solving problems and there 55% of the respondents are satisfied with performances of the WMCs;
- In Naogaon more than three fourths of the respondents (81%) said that the WMCs Supply and Distribution of Water solving problems and there 65% of the respondents are satisfied with performances of the WMCs; and
- In Chapai Nawabganj more than two thirds of the respondents (68%) said that the WMCs ensure maintenance and repair of deep Tube-well and irrigation channels and there 56% of the respondents are satisfied with performances of the WMCs.

Respondents recommended the following (bar graphs below) to further enhance the efficiencies of the Water Management Committees:

- The respondents in both Rajshahi (57%) and Naogaon (59%) emphasized on activating the WMCs through regularly holding meetings (once in a month) and also desiring that the WMCs would function with consensus and without influence; while the respondents in Chapai Nawabganj (59%) prioritized on raising awareness of the WMC members on their appropriate responsibilities and functions through training;

- Only one tenth of the respondents underscored the need for supervision and monitoring by WMC; and

- Only a meager percent of the respondents (4%) emphasized on the needs for undertaking repair and maintenance works by the WMC.



Section 5: Training Assessments: Coverage, Performance, Institutions

To build up a group of efficient and technical man power through intensive training regarding the activities like deep tube well operation and maintenance, irrigation and water management, construction and maintenance of water control systems, crop production, fertilizer use, crop diversification, afforestation, pisciculture, mechanized cultivation, electrification of small scale rural industries and maintenance & rehabilitation of rural feeder roads. Thirty thousand (30,000) people at the project area were trained (Ref-2). To evaluate this aspect of the Barind Command Area Development and Training Project, information were collected from trainees, trainers, project personnel, and also from the community (Household respondents).

Findings of Intensive Interviews with Trainees

Background: Characteristics of the Trainees: In total 182 trainees (all males) were interviewed using Intensive Investigation method (using a semi-structured open ended questionnaire). Some of the trainees received more than one types of training. Average age of the trainees is 40 with little different among 3 districts (2-3 years). Average educational level of the trainees is class 8. Before receiving training, 85% trainee's occupation was agriculture and after obtaining training it has increased from 85% to 92%. The other occupations of the trainees before and after training are service, business and enrolled as students. Of the trainees interviewed, 79% (144) are ideal farmers, followed by 29% (53) are tube well operators/drain man/coupon dealer, 10% (18) are fish cultivators, 4% (7) are mechanic or assistants, and 4% (8) are nursery workers. Current engagements of the trainees, as specified, exceed 100% as some of them perform more than one functions.

- Training of ideal farmers covered 9 major topics:
  - Crop diversification/ production of more crops (73%)
  - Proper use of fertilizer and pesticides (58%)
  - Collection of improved seeds and identify its quality (39%)
  - Proper use of water on land (10%)
  - Seedling plantation (4%)
  - Prevention of weeds on land (4%)
  - Application of insecticides on the land (2%)
  - Prevention of waste of irrigation (1%)
  - Rearing of domestic animal (7%): training on rearing of domestic animal were received only by the ideal farmers of Chapai Nawabganj.

- Training of Tube well Operators/ Drain men/ Coupon Dealers covered 7 major topics:

    - Installation of deep tube wells (76%)
    - Ensuring proper supply of water from DTWs (59%)
    - Prevention of wastage of water from shallow tube well (26%)
    - Mechanical Functioning of deep tube wells (20%)
    - Enlistment and Distribution of coupon (2%)
    - On alternative energy use (diesel) in absence of electricity (2%)
    - Cleaning the channels (2%)

- Assistant Mechanic received training on repairing of deep tube well (100%) and Agri-mechanic received training on mechanical cultivation.

- Nursery workers received training on 2 major topics that is:

    - Planting trees on adjacent land (100%) and
    - The impact of forests on environment (25%).

- Fishermen received training on 4 major topics and these are:

    - Fish cultivation (100%)
    - Giving feed to the fish (44%)
    - Prevention of fish disease (17%) and
    - Fish cultivation in the low land of deep tube well to mitigate the demand of food (11%)

As many as 9 different agencies and their personnel were involved in the training and of them maximum inputs were given by the experts/trainers from BMDA (97%), followed by those contributed by the resource persons from Agriculture Extension Department (55%), resource persons from Forest Department (4%), resource persons from Fisheries Department (10%), resource persons from Livestock Department (6). Rest of the persons (9%) were Upazila Nirbahi Officers, Officer in charge of Police Station and Palli Biddut Samity.

Table 9: Trainers of the training: in %

Trainers	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Trainers of Barind Multipurpose Development Authority	95	100	96	97
Officers of Agriculture Extension Department	71	69	33	55
Officers of Irrigation Department	20	6	22	17
Officers of Forest Department	5	6	1	4
Officers of Livestock Department	0	6	0	2
Local administration (UNO, OC,PBS)	8	16	3	9

Multiple responses

Different types of training materials were used in the training sessions. Among the materials used were: Black Board, Marker/Pen, Khata, Manual, Posters, Files, Chalk, Duster, Leaflet, Flip charts and demonstration equipment for repair of tube wells. Only 10% trainees received practical training on operation of deep tube well, preservation of improved seeds, plantation of paddy in the right way, preparing of seed bed, supervision and repairing of tube wells, and providing fertilizer according to the color of paddy leaf. According to the trainees', the level of knowledge, skills on imparting training of the trainers were very good (25%), good (64%),

moderate (12%) and bad (1%). On the other hand, level of quality of the training was very good (18%), good (56%), moderate (25%) and bad (1%).

Table 10: Level of knowledge, skill and capacity as trainers and quality of training: in %

Opinion	Rajshahi (n=61)	Chapainawab ganj (n=48)	Naogaon (n=73)	Total (n=182)
Level of trainers capacity				
Very good	28	19	22	23
Good	61	65	67	64
Moderate	10	16	11	12
Worst	1	0	0	1
Total	100	100	100	100
Level of quality of the training				
Very good	23	6	21	18
Good	53	42	67	56
Moderate	23	52	12	25
Bad	1	0	0	1
Total	100	100	100	100

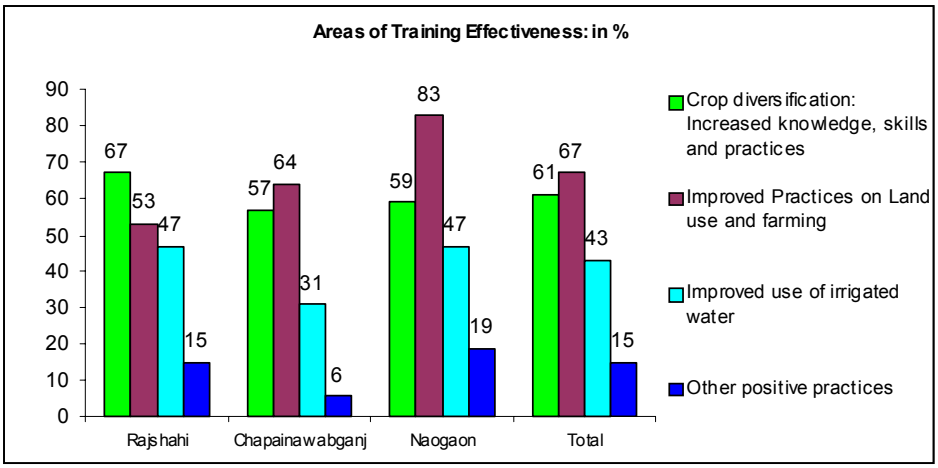
Little more than two thirds (68%) of the trainees opined that overall class room environment and sitting arrangements in the training session was good; about two thirds (66%) of the trainees opined that there was no residential accommodation facilities for the trainees. Less than half (43%) of the trainees mentioned that quality of food served to the trainees was good and 41% opined that it was moderate in quality. More than one third of the trainees (38%) mentioned that there was no transport facility to attend the training sessions, while 36% mentioned that transport facility was good and 14% opined that it was moderate. More than one third (36%) of the trainees mentioned that use of training materials in the training sessions were good; 37% mentioned those as moderate and 12% opined those as bad. Only 5% trainees assessed the training as ineffective as the training sessions were conducted partly unsuccessfully due to time constraints and also due to inadequacy of practical training.

Training Effectiveness:

The major focuses of training in order of priority were on:

1. The activities like deep tube well operation and maintenance, irrigation and water management, construction and maintained of water control system;
2. Crop production and fertilizer use, crop diversification;
3. Afforestation, pisciculture, mechanized cultivation, electrification of small scale rural industries and maintenance & rehabilitation of rural feeder roads.

But the assessments by the trainees on after training effectiveness show following outcome (as in Bar graphs below):



After training achievements as per assessments by the trainees in order of the degree of effectiveness are as follows:

1. Improved Practices on Land use and farming/improved Agriculture: 67%
2. Crop diversification: Increased knowledge, skills and practices: 61%;
3. Improved use of irrigated water: 43%;
4. Other positive and multi-sectoral practices: 15%

The training program focused on agriculture which is reflected by after training effectiveness by number 1 and 2 categories above; while the priority 1 of the Project, i.e., improved use of irrigated water became next to agricultural focus at after training effectiveness assessments. The performance on other multisectoral functions remained at a comparable of training and project objectives. The findings by districts are not different from the total aggregated performance.

Analyses of the specific areas of training effectiveness as in the Table 11 show comparatively low effectiveness on the following areas:

- Learnt and properly functioned tube well; and received adequate supply of irrigated water: 32%
- Repaired deep tube well, when damaged: 9%
- Learnt and prevented wastage of water: 2
- Advised others after training: 3%

Table 11: Respondent's opinion on training effectiveness at post training activities (both knowledge and skills): in %

Areas of Training Effectiveness	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
➢ Crop diversification: Increased knowledge, skills and practices	67	57	59	61
➢ Improved Practices on Land use and farming	53	64	83	67
Learnt and used proper quantity of fertilizer and pesticide in the land	27	46	32	34
Learnt, collected and used improved seeds; and helped in plantation of seeds & prepared seed bed	24	14	47	30
Removed weeds from cultivable land	2	4	4	3
➢ Improved use of irrigated water	47	31	47	43
Learnt and properly functioned tube well; and received adequate supply of irrigated water	32	22	37	32
Repaired deep tube well, when damaged	13	9	6	9
Learnt and prevented wastage of water	2	0	4	2
➢ Other positive practices	15	6	19	15
Learnt and started fish cultivation	5	0	10	6
Planting trees in the courtyard and earned additional income	5	2	8	6
Also advised others after training	5	4	1	3

Multiple responses

The trainees, on average, received 5 days training with maximum period of training reported is 30 days and the minimum being 1 day. When inquired whether the duration of training was adequate or not, half of the trainees (53%) reported that the duration of the training program was adequate, while 47% trainees reported that the duration of training was inadequate. The trainees recommended on average 2 weeks' (11 days) training.

Majority of the trainees (90%) opined that the subjects of training was easy to understand, while 10% trainees reported that they did not understand the subject of the training due to

short training period, inadequacy of practical training and difficulties to understand language. About three fourth (71%) of the trainees opined that the training curricula used was comprehensive. While about one third (29%) of the trainees viewed that the training curricula used was not comprehensive. They recommended inclusion of additional training components in the curricula. About one fourth (23%) of the trainees recommended that the issues of rearing of domestic animals should be included in more details in the training curricula. In addition, some other topics such as perishing of insecticides, production of fish fry, repair and maintenance of tube well and vegetable gardening were also recommended to be included in the curricula.

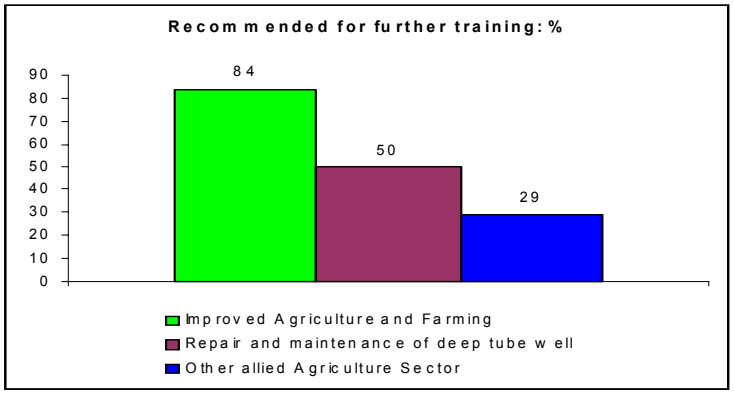
Measures for strengthening training program:

Ten different measures were suggested by the trainees for strengthening the future training programs:

- Repeat and refreshers' training (40%)
- More practical training (39%)
- Training on modernized cultivation (28%)
- Increased duration of training (13%)
- Train every farmer of the village (7%)
- Provide training allowances (4%)
- Equip the farmers with some tools (3%)
- Furnish the farmers with printed materials on improved farming (3%)

Extended areas of Training needs:

Overwhelming majority of the trainees (92%) recommended for their further training covering multiple areas:



Overwhelming majority (84%) despite their exposures on training areas covered under 'Improved agriculture and farming', recommended the following areas

- Modern cultivation methods (61%)
- Improved seeds (9%)
- Use of fertilizer and pesticides (5%)
- Vegetable cultivation (3%)
- Prevention of plant diseases (2%)
- Wheat cultivation (2%)
- Improving intensity of cultivation on small plots of land (2%)

About half of the trainees prioritized their training in future on repair and maintenance of deep tube well (50%). Only 9% could use their training on the repair and maintenance in the past.

Only 15% mentioned that they could use their training on 'Other allied Agriculture/ Multisectoral Aspects', but about double the proportion (29%) recommended the same as future areas of emphasis:

- Fish cultivation (16%)
- Rearing of domestic animals (8%)
- Afforestation including fruit bearing trees (3%)
- Cow fattening (2%)

Participation to Project Activities

About three fourths (61%) of the trainees were involved in BMDA's activities, while 39% trainees were not involved. The trainees are involved with BMDA's activities, such as tube well operator (54%), drain man (3%), manager (2%), member (1%) and night guard (1%)'. In this regard, responsibilities of trainees are: maintenance and operation of tube well (77%), ensure water supply and distribution (76%), writing log book (10%), distribution of coupon among the farmers (3%), repair of tube well (3%), control wastage of water (2%), cleaning of drain (2%) and inform concerned officers regarding the problem of tube well (1%)

Necessary equipment supplied to the trainees during the training period included: plus (82%), screw driver (73%), range (36%), slai range (18%) and cut out, hammer and meter (9% each). All the respondents assessed that training was an important and effective intervention.

Repair and Maintenance of Deep Tube Well and Piped and Pucca channels

About half of the trainees (52%) informed that the BMDA performed the functions of repair and maintenance of deep tube wells, while 38% trainees reported that such functions was discharged by the care takers, followed by beneficiaries 6% and scheme committee 4%. On the other hand, 42% trainees informed that the care takers are responsible for repair and maintenance of Buried Pipe/Pucca Irrigation Channels, while 37% trainees informed that such responsibility was discharged by the BMDA, followed by beneficiaries (12%) and scheme committee (9%).

BMDA and beneficiaries share the costs of the repair and maintenance of deep tube wells around 48% and 42% respectively, followed by care takers 8% and scheme committee 2%. In Naogaon, most of the costs for repair and maintenance of the DTWs are borne by the BMDA (77%); and only 6% of the costs for repair and maintenance of the DTWs are borne by the beneficiaries.

Similarly as regards the costs of the repair and maintenance of the channels the beneficiaries and BMDA share the costs to the extent of 46% and 41% respectively, followed by the care takers (11%) and scheme committee (2%). In Naogaon, most of the costs for repair and maintenance of the channels are borne by the BMDA (74%) and only 6% of the costs for repair and maintenance of the channels are borne by the beneficiaries. Repair and maintenance works of deep tube wells and channels were undertaken as and when necessary.

Most of the trainees (76%) mentioned that they received following assistance from BMDA:

- Received mechanical support through technicians (36%),
- Repair equipment support, if damaged (29%),
- Received support in case of major problems (14%),
- Minimum financial support (13%) and
- Other assistance, if necessary (9%).

While about one fourth (24%) of the trainees mentioned that they did not receive any assistance from BMDA.

Majority of trainees (81%) mentioned that Barind Multipurpose Development Authority (BMDA) performed the follow—up checks on deep tube well/irrigation channels, while 19% trainees mentioned that BMDA did not perform this job.

Overwhelming majority (95%) of the trainees mentioned that deep tube wells were functioning properly, while only 5% trainees mentioned that it was not functioning properly. Majority (88%) of the trainees mentioned that the buried pipe irrigation channels were functioning properly and only 12% trainees mentioned that it was not functioning properly. More than one thirds (38%) of the trainees mentioned that pucca irrigation channels were functioning properly, while about two thirds (62%) trainees mentioned that it was not functioning properly.

Community estimates on coverage of Training

Responses from the households evidence that over hundred thousand community people (127,938: 4.75% of the rural population of age 18 or above) age 18 or above were trained on an average for 8 days. The major areas of training are: Ideal farmer (84%); fish farming (13%); Tube well Operator/Drain men/Coupon dealer (10%). The current survey data were collected during mid 2009, i.e., 3 years after the completion of the first phase of the project (2006). Already the second phase of the project started in 2006 and is continuing, for which the estimated numbers trained by the household respondents exceeded beyond the target of the first of the project (30,000). This is an evidence that the coverage of training during the first phase was satisfactory. However, the proportional coverage of training in Rajshahi was little higher (72,403:7%) of the rural population of age 18 or above); followed by Chapai Nawabganj (23,081: 4%) of the rural population of age 18 or above); and Naogaon (32,454: 3%) of the rural population of age 18 or above). Here it may be mentioned that during the first phase there was only one training center compared to about 3 centers operated during the second phase.

Observations of Training Shade

The project proposed target was to establish and operate 4 Nos of (1902 Sq.m) training shades (center) with a covered area of 1902 sq. m. during the first phase; but the project established only one training shade/center covering the same covered area of 1902 sq. m. The same training shade was observed by (physically verified) using a pre designed guidelines.

The data on assessments of the Training Center were collected through interviewing the key informants (trainers and management staff). The observed findings are summarized below:

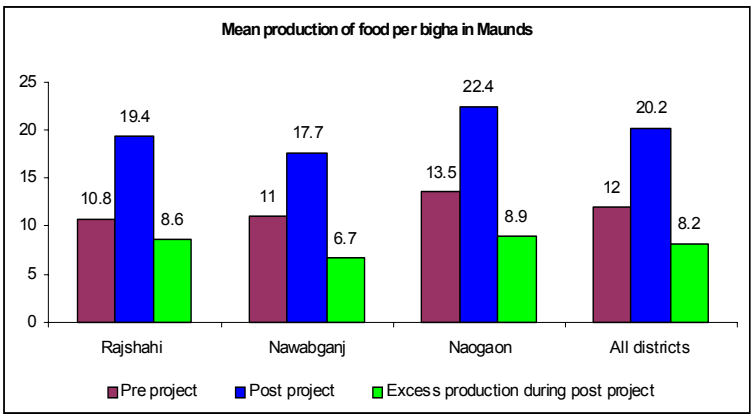
- Training Center was established near Barind Head Office in Rajshahi during the 1998-99 session; Since 1999, training programs are being conducted in this building.
- Quality of Physical Structure: Total covered area of the training center is1902 sq meter; One two storied building with total four rooms was constructed, but only one room is used for conducting training;
- Per batch of trainees varied between 40, 120, and 170 participants and as reported by the key informants a total of 30,000 participants were trained during the first phase;
- Class Rooms are well decorated with fans (15), chairs (180) and tables (20); Present condition of the room is very good; Training room has air condition facility; it has two attached sanitary toilets.
- Sitting arrangement of the training room can accommodate 180 persons.
- Training room has sufficient ventilation and lighting circulation.
- Sufficient IEC materials are used at the time of the training but it has no recreational facilities.
- Training center is neat and clean. It is occasionally used as conference room.

Section 6: Agriculture Productions and Performances

Irrigation is the lifeline of agriculture, because without irrigation facility multiple crops or HYV cultivation would be impossible. Traditional agricultural practices were dependent upon the rainfall and thus the tract became a mono crop area. Irrigation plays the vital role to improve agricultural production. Introduction of irrigation facilities assured production of crops in the dry season. As well as food production through supplemental irrigation for the rain fed crops, ensured greater productivity and created employment opportunities in the crop production sector. Bangladesh is deficit in food grains, fish, meat and milk. Increased productivity in agriculture (production of food grains, fish, meat, milk) is a major target of the development plan of the country to achieve higher living standard of the small, marginal and landless farmers. With a view to increasing self-sufficiency of the beneficiaries in food production through irrigation facilities and training, Barind Command Area Development and Training project was implemented. This chapter provides information on scenario on beneficiaries' performances on land use, crop intensity, production status, poultry and fish production, and environmental impact pre and post project of 12 Upazilas under Rajshahi, Nawabganj and Naogaon districts.

Status of Food Production: A Comparison of pre and post project periods

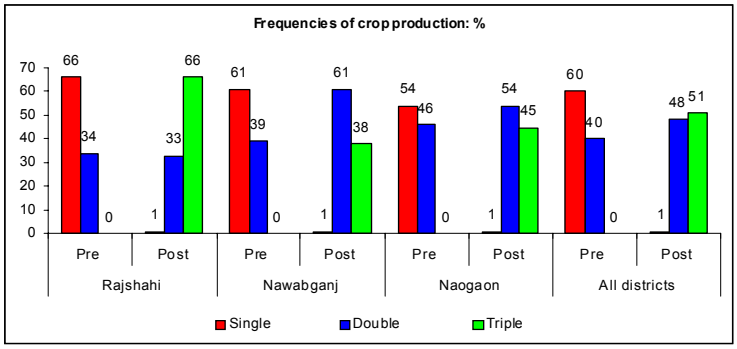
Hundred percent of the household respondents opined that food production has significantly increased due to implementation of Barind project and such performance was uniform across districts. Bar graphs below illustrate average food production (in maunds per bigha) comparatively by pre and post project periods by districts.



Overall food production increased by 68% in all the three districts during post project period over the pre project. Highest production level was achieved in Rajshahi, where the food production per bigha of land during the post project period over the pre project increased additionally by 80%, followed by Naogaon (66%) and Chapai Nawabganj (61%).

Status of Multiple Crops Production in Barind Project area

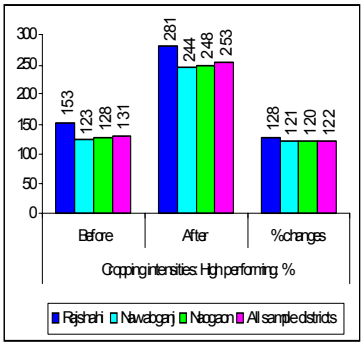
Almost unanimously the respondents (98-99%) claimed that their performances on the frequencies of crop productions turned from mostly single crop production during pre project period (Single: 60%; Double 40% and Triple: 0%) to mostly multiple crop productions during post project period (Single: 1%; Double: 48%; and Triple: 51%).

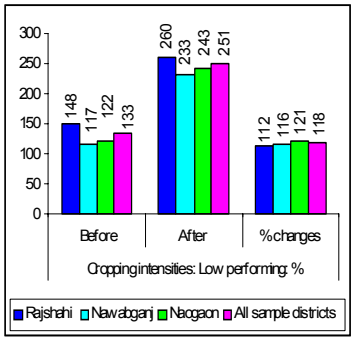


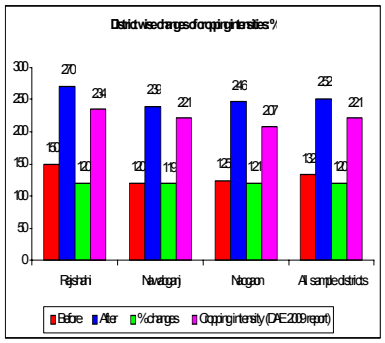
The situations of the frequencies of crop productions improved most substantially in Rajshahi, where the triple crop production increased from 0 to 66%; followed by Naogaon, where triple crop productions increased from 0 to 45% and in Chapai Nawabganj, it improved from 0 to 38%.

Impact on cropping intensity

One of the main objectives of the project was to increase cropping intensity from 117 to 222% by bringing more land under cultivation through introduction of irrigation water and suitable crops. In this evaluation for determining the cropping intensity, interviews in 4800 households were conducted. District wise cropping intensities before and after project is shown in bar graphs below. The study results shows that the cropping intensity has increased by additionally by 122% (from 131% to 253%) in high performing area and 118% (from 133% to 251%) in low performing area. The increase in cropping intensity was the highest in case of Rajshahi district (from 148-153% to 260-281%). The cropping intensity gradually (day by day) increased from 131% in the pre project period to 253% in the year 2009, which is higher than the DAE crop intensity level (207 -234% under 3 districts) reported in 2009. Another study on Impact evaluation of BIADP cropping intensity were reporting 200% in the year 2000 (Kranti Associates Ltd, July 2000). Findings clearly indicated that tremendous positive impact were achieved on cropping intensity after implementation of the project. The single crop area has significantly decreased with increase of double and triple crop areas. Therefore, it can be concluded that the increase in utilization of fallow land increased through cropping intensity, and this was induced by increase in the production of vegetables, cereal and fruit crops in three seasons of the year.

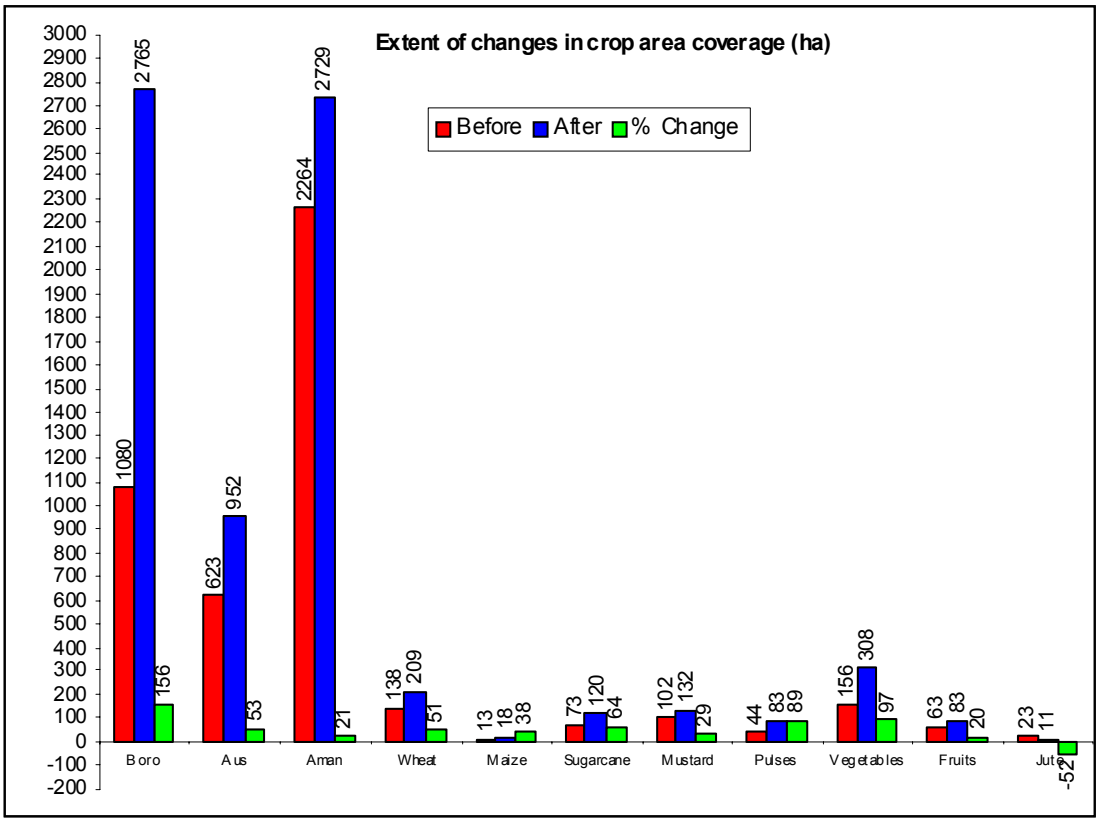






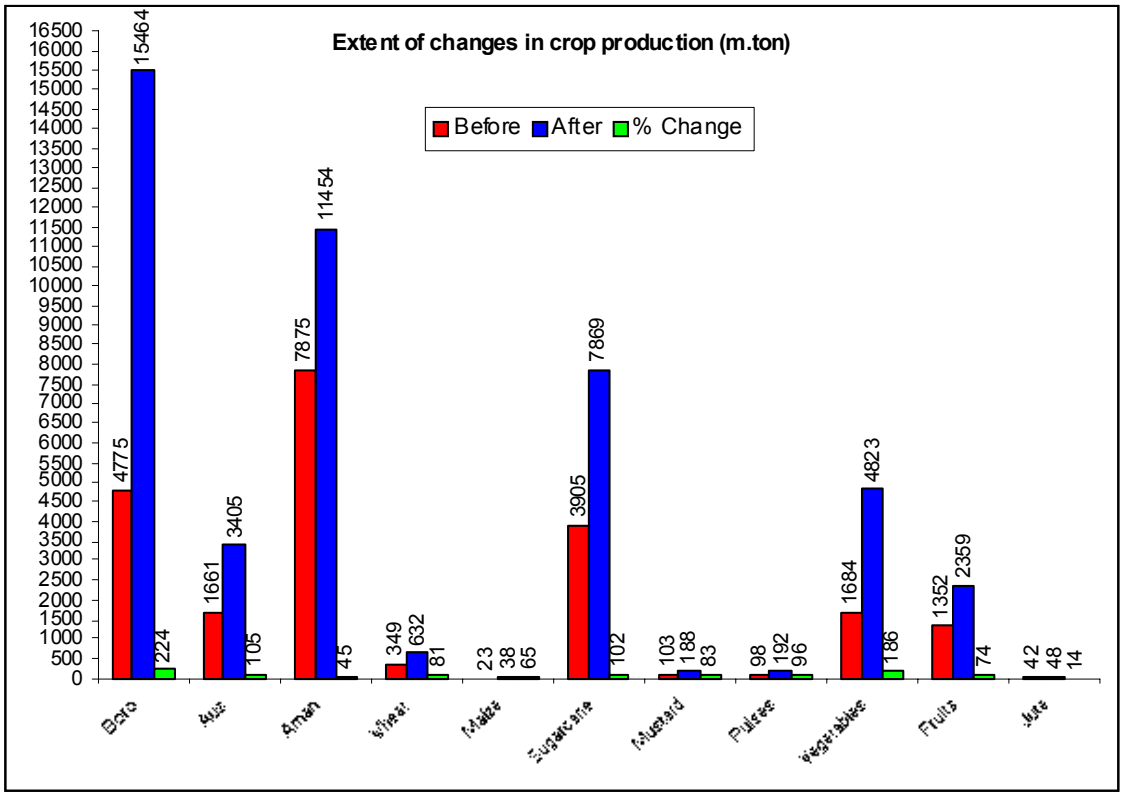
Impact on crop area

From the sample household survey data, the extent of changes in crops area and production level before and after project scenarios are shown in bar graphs below. A wide variety of crops are grown in three survey districts throughout the year. The major cultivated crops were: Boro, Aus, Aman, Wheat, Maize, Sugarcane, Mustard, Pulses, Vegetables, Jute and Fruits etc. after intervention of the project. With the increased availability of the irrigated water, the agricultural scenario fundamentally changed. Survey findings show that the major changes occurred in Boro crop (156%), Vegetables (97.44%), Pulses (88.64%) and sugarcane (64.38%) during post project in three districts. Bar graph below shows that 52.17% Jute cultivated area decreased after intervention of the project. It may be impact of low market price of Jute. Aus (53%), Wheat (51.45%), Maize (38.46%), Mustard (29.41), Aman (20.53%) and Fruits crops (20%) also considerably increased at post project period.



Impact on crop production

Analyses of survey data results depict that after the project period overall crops production increased annually (bar graphs next page) and the increased scenarios are in: Boro (223.85%), Vegetables (186.40%), Aus (105%), Sugarcane (101.51%), Pulses (95.92%), Mustard (82.52%) and Wheat (81%) at post project period. It may be due to availability of irrigated water and high yielding varieties of crops replaced by low yielding local varieties. People are tremendously encouraged and motivated to grow HYV crops that fetched them very good return against investments. It is a real contribution of the project to the beneficiaries for self-sufficiency in food production.



Fertilizer Application

Soil is the principal supplier of plant nutrients. Plants derive 13 essential nutrients out of 16 from the soils. But soils vary considerably in their inherent capacities to supply nutrients which gradually decline over time due to intensive cropping with high yielding varieties, very little or no use of organic materials and improper soil and crop management practices. As a result, crops suffer from inadequate supply of nutrients which is reflected in poor yield and quality. Therefore, there is a need to add nutrients to the soil through fertilizers in order to get desired yields. The most logical way to raise the total production at the national level from our limited land resources is to raise the yields and increase cropping intensity. This approach will induce rapid depletion of nutrients from the soil, causing a deficiency of the same. The situation is likely to aggravate further if fertilizer nutrients are applied in an unbalanced way again and again. High yielding crop varieties under intensive cropping will fail to express their full potential unless plant nutrients are supplied adequately and appropriate proportions. Balanced use of fertilizer nutrients in crops and cropping pattern will act as an insurance against possible nutrient deficiencies that may be created by the repeated use of a single fertilizer nutrient. Besides, balanced fertilizer can play a vital role in sustaining yield of crops and cropping patterns as well as in maintaining fertility status of soils on a long term basis. The farmers' use status of different kinds of fertilizers before and after Barind project is shown in Table 12. The results of the Table clearly indicate decreasing the trends in the application of manures (such as cow dung, compost) after intervention of project. About 55-80% respondents applied high amount of manures before project; whereas, only 23-40% respondents used high amount of manures i.e. manure usage declined about 50%. Study result shows that 45-95% respondents did not apply TSP, MP, Zinc, Boron and mixed fertilizers before intervention of project; whereas, 70-95% of the respondents used only urea before implementation of the project, which was detrimental to soil health and production. Further, 54-80% sample respondents reported that different chemical fertilizers such as Urea, TSP, MP, Zinc, Boron and mixed fertilizers were used in crop fields after implementation of the project i.e. farmers are using balanced chemical

fertilizers. These findings reflect the positive impact of training. Nowadays, cow dung are used as fuel instead of manure. Farmers are to be motivated for increased use of manure or compost or green manure through training.

Table 12: Status of fertilizer application pre and post project periods: in %

Status of fertilizer application	Total					
	Pre Project			Post Project		
	No use	Less	High	No use	Less	High
Rajshahi						
Uriea	13	11	76	0	15	85
TSP	74	25	1	1	26	73
MP	59	39	2	8	49	43
Mixed fertilizer	67	26	7	40	30	30
Manures	2	18	80	7	60	33
Other (Zinc, Boron)	96	4	0	0	41	59
Nawabganj						
Uriea	6	24	70	5	34	61
TSP	61	31	8	6	34	60
MP	65	24	11	9	36	55
Mixed fertilizer	45	31	24	27	16	57
Manures	14	31	55	23	56	21
Other (Zinc, Boron)	3	61	36	4	55	41
Naogaon						
Uriea	3	2	95	1	8	91
TSP	87	12	1	1	19	80
MP	82	17	1	4	19	77
Mixed fertilizer	70	29	1	39	41	20
Manures	6	33	61	5	61	34
Other (Zinc, Boron)	95	2	3	0	38	62
All sample districts						
Uriea	7	78	16	1	19	80
TSP	15	76	9	3	26	71
MP	23	71	6	7	35	58
Mixed fertilizer	59	32	9	35	29	36
Manures	7	28	65	12	59	29
Other (Zinc, Boron)	2	87	11	1	45	54

Multiple responses

The insects and diseases are chronic problems in crop production sector. The extent of pest damage depends on types of pest species, population, crop varieties and season. The highest pest infestation and damage occurred in Aus and Aman crops. Green leafhoppers stem borers and white leafhoppers were the most prevalent insect pests in Rajshahi region (BRRI Report 2006). The incidences of sheath blight and bacterial disease were higher in rice crops. In wheat, about 20% crop damages are caused by rats every year. The extent of pre harvest crop damage on an average was 10-15%. The opinion of the farmers on insects and disease infestation compared to before and after the implementation of Barind Project is shown in Table 13. Majority of the sample respondents (61-85%) expressed that insect and disease infestation was less before implementation of the Barind project. Whereas, 75-92% farmers opined that insects and disease infestation were high after implementation of the project. It may be due to change of cropping pattern from mono crop to cultivation of multiple crops. Further, introduction of Hybrid and HYV crops as well as availability of crops throughout the year has created favorable condition for increasing pest population. The findings of study clearly indicated that insects and disease infestation continuously increasing after intervention of project. Different crops were infested by different pests, because same pests were not infested all types of crops. For better pest management farmers need to know the pests. There is a need for increasing farmer's knowledge on pest management technology through training, otherwise crops losses by pests will be increased.

Table 13: Status of insects and disease infestation pre and post project periods: in %

Status of insects and disease infestation	Rajshahi n=1600		Nawabganj n=1200		Naogaon n=2000		All districts n-4800	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
No infestation	5	3	3	4	11	2	6	3
Less	85	17	61	21	80	8	74	15
High	10	80	36	75	14	92	20	82

Amount of pesticides used for controlling the insects and diseases before and after the implementation of Barind project is shown in Table 14. Study findings show that 54-84% of farmers under three districts used less amount of pesticides in their crop fields; whereas, 61-80% of the sample respondents used high amount of pesticides after intervention of projects. This increased the trend of use of pesticides in farming areas for different crops of HYV, as the cultivators were instructed to use more pesticides. The HYV crop growers generally used pesticides as preventive as well as curative measures. More use of pesticides developed pest resistance problems. It has created an imbalance between pest and defenders ratio. It has also created environmental pollution, which affected health status of the farmers and other animal. The findings clearly indicated that farmers lacked knowledge on use of non-chemical methods. According to information collected from households, pesticides are non-judiciously used. In this context, the program need to change farmer's attitude towards increased use of pesticides and at the same time increase farmers' knowledge on harmful effects of pesticides as well as the benefits of non – chemical pest control methods.

Table 14: Status of pesticides used for controlling insects and diseases pre and post project periods: in %

Status of pesticides use	Rajshahi n=1600		Nawabganj n=1200		Naogaon n=2000		All districts n-4800	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Not used	16	7	11	3	5	16	10	9
Less used	60	13	54	24	84	23	66	20
High used	24	80	35	73	21	61	24	71

Pesticides mean insecticides (for insect control), fungicides (for disease control), weedicides (for weed control), rodenticides (for rodent control), acaricides (for mites control) and all others poisons. Pesticides used in crops by farmers before and after the implementation of Barind project are shown in Table 15. The highest amount of pesticides applied was egg plant (218%), tomato (135%), paddy (128%), vegetables (125%), banana (116%) and beans/cabbage (100%) after the intervention of the project. In other crops, the increased range use of pesticides was 32-65%. Farmers generally used pesticides as preventive measures and without considering the waiting period of pesticides. This finding clearly indicates that farmers need more training on pest management technology and judicious use of pesticides.

Table 15: Pesticides used in crops pre and post project periods: in %

Crops	Rajshahi n=1600		Nawabganj N=1200		Naogaon n=2000		All districts n-4800		% increased
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	
Egg plant	20	59	32	63	30	56	27	59	218
Tomato	28	41	27	36	21	37	28	38	135
Paddy	45	89	38	91	35	88	39	92	128
Vegetables	20	51	27	54	24	58	24	54	125
Banana	30	36	33	38	31	35	31	40	116
Beans/Cabbage	31	53	20	55	27	49	26	52	100
Mustard	23	35	15	32	21	34	20	33	65
Mango	30	65	38	71	35	33	34	56	65
Patol	20	26	18	23	14	31	17	26	52
Onion	17	25	19	28	15	23	17	25	47
Wheat	12	19	15	21	13	18	13	19	46
Potato	17	24	25	35	23	38	22	32	45
Jute	8	12	12	14	11	16	10	14	40
Sugarcane	24	34	32	40	29	37	28	37	32

During the last two decades, BMDA initiated many programs to improve the coverage of forest land. Plants grown in homestead can support alternate livelihood activities during moderate to severe drought conditions. Growing of fruit trees is essential to provide nutrition as well as for earning cash income for the farmers of landless and poor families. Steps were taken by BMDA to encourage the target families to plant more fruit trees in the homestead and also in the fallow land. Training was conducted to teach improved management techniques for growing and management of fruit trees and other plants. Overall 100% respondents both from high and low performing areas under the project opined that tree plantation increased significantly.

Table 16: Status of increased tree plantation in both high and low performing areas under project: in %

Response	Rajshahi n=1600			Chapai Nawabganj n=1200			Naogaon n=2000			All districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	100	99	100	99	99	99	100	100	100	100	100	100
No	0	1	0	1	1	1	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	100	100	100	100
Types of trees plantation increased												
Fruity trees	94	92	93	97	91	94	99	96	97	97	93	95
Wood trees	89	86	87	24	24	24	73	65	69	62	58	60
Medicinal plants	3	1	2	0	0	0	1	1	1	1	1	1

H=High; L=Low; T=Total

Participation to fish production as perceived by the respondents during post project periods comparatively between high and low performing areas are shown in the Table 17. With very minor differences between high and low performing areas and also across districts the participation to fish production was above 90%.

Table 17: Status of fish production between high & low performing areas at post project: in %

Districts	High performing area	Low performing area
	Yes	Yes
Rajshahi	91	83
Nawabganj	94	91
Naogaon	98	97
All sample districts	94	90

Participation to poultry production as perceived by the respondents during post project periods comparatively between high and low performing areas are shown in the Table 18. With very minor differences between high and low performing areas and also across districts the participation to poultry production was above 90%.

Table 18: Status of poultry production between high & low performing areas at post project: in %

Districts	High performing area	Low performing area
	Yes	Yes
Rajshahi	93	89
Nawabganj	99	97
Naogaon	99	97
All sample districts	**97**	**93**

Participation to livestock rearing as perceived by the respondents during post project periods comparatively between high and low performing areas are shown in the Table 19. With very minor differences between high and low performing areas and also across districts the participation to livestock rearing was above 80%.

Table 19: Status of livestock rearing between high & low performing areas at post project: in %

Districts	High performing area	Low performing area
	Yes	Yes
Rajshahi	94	88
Nawabganj	89	90
Naogaon	79	86
All sample districts	**87**	**88**

Only 13% of the respondents perceived positive impact of environment in BMDA areas at post project period (marginal differences between districts) Table 20.

Table 20: Status of environmental impact at post project periods: in %

Positive impact	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Overall Environment improved due to tree plantation	11	15	16	13
Negative impact of Environment				
Fertility of the land reduced because use of chemical fertilizers	37	65	34	35
Increased insect and disease infestation	21	13	40	28
Disease borne by mosquitoes/flies increased	27	0	4	20
Pisciculture blocked in the open water	4	7	6	4
Total	100	100	100	100

Negative environmental impacts according to the respondents were caused by fertility of the land reduced because use of chemical fertilizers (35%); increased insect and disease infestation (28%); disease borne by mosquitoes/flies increased (20%); and pisciculture blocked in the open water (4%) in that order.

Section 7: Intensive Interviews with personnel of BMDA & Allied Organizations

Intensive interviews were conducted with District and Upazilla personnel of BMDA and with personnel from the allied organizations (Fisheries, Livestock, Agriculture, Palli Bydut, Ansar-VDP and Youth Development):

- BMDA personnel:
  - ✓ District level officials—7 (Executive Engineers, Higher Deputy Assistant Engineer);
  - ✓ Upazilla level Personnel—55 (Deputy Assistant Engineer, Assistant Engineer Senior Deputy Assistant Engineer, Mechanic, Assistant Mechanic, Storekeeper, Supervisor, Assistant Accountant and Foreman)

- Allied Multisectoral Departments' Personnel: 32 (Deputy Assistant Agriculture Officer, Assistant Agriculture Extension Officer, Upazilla Agriculture Officer, Additional Agriculture Officer, Agriculture Extension Officer, Upazilla Ansar and VDP Officer, Assistant Palli Unnayan Officer, Upazilla Youth Development Officer, Upazilla Fisheries Officer, Upazilla Livestock Officer).

Findings of the Intensive interviews with program personnel are summarized below:

Socio Demographic characteristics: The respondents were all male and their average age was 44 years, average level of education was Graduate; and the highest degree achieved was Masters while the lowest was 8th grade. Average length of service of the officials in the current post was 3 years with a maximum of 26 years and a minimum of 1 year.

Participation to Project: Regarding the involvement of the respondents in the project activities, it was learned that majority from BMDA (89%) and half (50%) of the other allied organizations' officials were involved directly with it. Large number of the respondents from BMDA (67%) were Involved in the training program as a trainer of the project , followed by involvement in the supervision of construction of buried irrigation system/structure (33%), management and maintenance of deep tube well (22%) and provide lay out for the construction of irrigation area (14%). The majority of the respondents from allied organizations were involved as a trainer, followed by management and maintenance of deep tube well, monitor whether the farmers are getting irrigation water properly, supplying irrigation water100 hours free of cost as a tag officer and take care of Boro scheme (7% each).

Opinions on Irrigation Program efficiencies: An overwhelming majority of the BMDA officials (96%) and more than half (54%) from allied organizations opined that, the project work was completed properly as per target. Only 4% officials from BMDA and about half (46%) of the officials from allied organizations either not aware or were not involved with the project. Over two third (71%) of the officials and staff from BMDA and about one fifth (21%) officials and staff from allied organizations mentioned that, the project work was completed properly and within the allocated funds, though about one fourth (25%) officials from BMDA and three fourth (75%) officials from the allied organizations were not aware of the project. Overwhelming majority of the respondents (61%) from the BMDA and from the allied organization jointly mentioned that there was no problem in purchasing and using the materials, although about one third (35%) of them were not aware of the project. Only 4% respondents reported that there was some problem due to theft and burnt of transformer. Most of the officials from BMDA (98%) and about half (46%) officials from allied organizations mentioned that the concerned project personnel supervised the implementation work. In total, most of the respondents (81%) mentioned that the concerned project personnel supervised the implementation work, while only 3% of them mentioned

that the concerned project personnel did not supervise the project implementation work. About one sixth (16%) officials from allied organizations were not aware of supervision/local inspection of the project activities.

In the opinion of about three fourth (76%) of the respondents from BMDA and more than one third (39%) respondents from allied organizations there was no problem during the project implementation, while 4 % respondents from BMDA and 57% respondents from other allied organizations either did not know or were not involved with the project. Only 20% respondents of BMDA reported that, there were some problems during the project implementation work. Initially the farmers were not encouraged (7%), few farmers protested (7%), farmers were more interested to install tube well in their own land, which created problem (4%) and problem created with the direction of pipe line under influence of local leaders (2%). Only 4% respondents of allied organizations mentioned that, there were problems with project implementation as initially the farmers were not encouraged. The problems were solved through discussion and motivation of farmers and cooperation with local influential and Upazilla Administration.

More than half (58%) of the respondents (BMDA 75%, allied organizations 25%) opined that supervision committee was formed by the local representatives during project implementation period, while 10% of them opined that, no such committee had been formed (BMDA 13%, allied organizations 4%). About one third (32%) of the respondents (BMDA 12%, allied organizations 71%) either did not know or were not involved with the project. Of those who mentioned that no supervision committee was formed, majority of the respondents, both from BMDA and from allied organizations affirmed there was no such instruction from the authority; BMDA supervised it and the formation of committee was not necessary.

About two third (63%) of the respondents (BMDA 78%, other organizations 32%) mentioned that local representatives' opinions were taken during the implementation of the project, whereas only 12% mentioned (BMDA 15%, other organizations 7%) that the opinion of local representatives' were not taken during the implementation of the project. And one fourth (25%) respondents from among them opined they (BMDA 7%, other organizations 61%) did not know or were not involved with the project.

Effectiveness of Water Management Committees: Overwhelming majority of the BMDA officials (91%) and more than three fourth (78%) of the officials of allied organizations opined that Water Management Committee was formed for implementing the Barind Irrigation project, while only 9% of the BMDA officials and only 4% of the other organizations officials opined that, no such committee had been formed. About 18% of the allied organizations either did not know or were not involved with the project. Water Management Committee performed various activities such as: look after the equal distribution of water (90%), collect charge of irrigated water (11%), maintain communication with BMDA (7%), monitor and maintain deep tube well (5%) and raise awareness on the project (2%).

Regarding the responsibility of irrigated water supply and distribution, almost half (44%) respondents opined that scheme committee did the job while nearing respondents (43%) said that the job was done by tube well operators. But a small group (13%) told that it was done by drain men.

Efficiencies of Repair & Maintenance of Deep Tube Well, Piped & Pucca Channels: Deep tube-well and buried pipe/pucca irrigation channels maintenance were done by several authorities. About 74% of the deep tube-well and 64% of buried pipe/pucca irrigation channel maintenance was done by BMDA. Remaining portion of maintenance of deep tube well was done by care taker (15%), beneficiaries (7%), scheme committee (4%), and that of buried pipe/ pucca irrigation channel was done by care taker (16%), beneficiaries (12%), scheme committee (8%). Majority of the BMDA and other organization respondents (100-64%

respectively) reported that implemented project maintenance was done properly. Most of the repair and maintenance works were done according to the necessity (34%) with fund from BMDA.

Most of BMDA and other organization respondents (63%) reported that fund allocated for repair and maintenance of the implemented project were done properly. But, about one third (30%), however, did not know the issue. Half of the respondents knew about the availability of enough fund for maintenance.

Supply and use of irrigated water: Almost all (94%) of BMDA and majority (68%) of other organizations' respondent's reported that irrigation water was sufficient round the year in the project area. More than one third (36%) of both BMDA and other organizations personnel agreed about scarcity of irrigation water in the month of Chaitra (Kharip-1). During dry season the water level abnormally goes down. BMDA respondents reported that lack of sufficient number of irrigation channel and shortage of electricity was the cause of scarcity or shortage of water. Both BMDA and other organizations' almost all respondents' (96%) said that irrigation water was fully utilized.

Reduction of Wastage of Irrigated Water: Almost all (98%) of the respondents (BMDA—100% and other agency—96%) claimed that irrigated water wastage was reduced at present stage in comparison to prior the constructions of buried pipe/pucca irrigation channel. The wastage of irrigated water was reduced by 35% at post piped channels system compared to previous kaccha channels system ((BMDA—37% and other organizations —28%)). Overwhelming majority (88%) of the respondents (BMDA—100% and other organizations—75%) claimed that the cost per bigha of irrigating water reduced during post project implementation period compared to pre project implementation. In the overall, the reduction of the costs for irrigated water per bigha is Tk 455 (44%) comparatively at post project implementation period over the pre project; however, the highest reduction of the costs have been experienced in Naogaon Tk. 575 (52%) followed by Chapai Nawabganj Tk. 440 (37%) and Rajshahi Tk. 259 (33%).

Coverage of irrigated land: The analysis of findings showed that about 90% of overall irrigated land of CAD areas were increased under three districts. The highest irrigated land was increased under the district of Rajshahi. The charges for irrigated water ranged between Tk. 60 to 100 per hour and most of the times the payments were made in cash (48%).

Problems experienced in water supply: More than half (52%) of the respondents did not face any problem during water supply, while less than half (48%) of the respondents faced problems in it. The specific problems were Insufficiency of drinking water experienced primarily due to lack of uninterrupted supply of electricity (22%), broken and damage status of the channel (13%) and going down of water level (13%), and District officials found problem with the falling of the water layer causing obstacle for getting water.

Agriculture Productions and Performances: Hundred percent of the respondents opined that crop production has significantly increased due to implementation of Barind project. Increase of paddy production as a result of Barind project implementation was almost double (92%). Before project it was 12.23 maund on average per bigha and after the project implementation it reached to 24.08 maund per bigha. Overall food production increased by 97% during the post project period. There was increase in production of wheat (58%), potato and vegetable (27% each), followed by mustard (18%), corn (17%), sugarcane (6%), onion (4%), mugh and mashur (pulse), banana, watermelon (9% each) as a result of the implementation of the project. The production area has also increased to a great extent (74%) as a result of buried pipe/pucca irrigation channel established under the project. Most of the respondents (96%) claimed that the frequency of crop productions has improved. The study results showed that the cropping intensity has increased by 105% (from 117% to 222%).

Section 8: Assessment of Infrastructure: Findings of Observation of Irrigation Channel (Buried pipe and Pucca)

The samples for observations and physical verifications comprised 51 Buried pipe and Pucca Irrigation channels connected with 48 DTWs in 48 selected villages in 12 Upazilas of 3 districts were observed (using detailed observation checklists). Trained senior field investigators under supervision of experts verified overall status of the irrigation channels: extent of completion of the infrastructures, their quality, operation and maintenance status and use effectiveness. Apart from physical verifications, the information were also substantiated through review records and consultations with the key informants of the area.

Physical Target and Achievement: Number of channels observed were 35 Buried pipe and 16 Pucca channels. The total length of channels verified were 30176 meters length of channels, of which 21045 meters are piped channels and 9131 meters are Pucca channels. Maximum length of each Buried pipe irrigation channel is 792 meters and minimum length is 427 meters. Maximum length of each Pucca irrigation channel is 915 meters and minimum length is only 91 meter. Buried pipe (channel) construction work was done during 1996 to 2006 and Pucca irrigation channel was constructed during 1996 to 2002. As per design target, mean length of Buried pipe irrigation channel was 578 meters and the pipe was 10 inches in diameter and verifications almost matched the same properties of the pipe. In case of Pucca irrigation channels, mean length was 542 meters, width and height were, 0.45700 meter and 0.457 meter respectively.

Present Condition of Pipe and Pucca Irrigation Channels: Out of 35 Buried pipe irrigation channel, 17 (48%) units are in very good condition, 9 (26%) units are in satisfactory condition and the rest 9 (26%) units are in bad: with holes/cracks/splits etc) condition. It was found that, in some cases water could not flow properly due to the holes; water supply is being disrupted since the layer is going beneath the level; valve has been damaged; electric board has been damaged; and connecting area of the pipe is damaged. The evaluation team observed of the 16 Pucca irrigation channels, 6% are very good, 63% are bad and 31% are in worst conditions: with holes/cracks/splits etc) condition. It was found that water was leaking due to damage of the Pucca irrigation channels and due to moss at the bottom of the irrigation channels.

Quality of Construction: In both Buried pipe and Pucca irrigation channels, there are some construction faults: in 14% of the channels there is faults both in Buried pipe and Pucca channels as those are not constructed according to the design. Water leakage through socket and Outlet are common problems.

Availability of Irrigated Water: From 75% channels, beneficiaries obtain sufficient water from both types of water channels and in 25% cases beneficiaries do not obtain sufficient irrigated water because water supply is being disrupted since the layer is going beneath the level, due to disruption of electricity, lack of sufficient irrigation channels and irrigation channel are broken and cracked. In the majority of the cases, scarcity/shortage of electricity (67%), which is acute during the months of March -April.

Status of Fulfillment of Demands for Irrigated Water: People from the catchments of 31 (61%) channels mentioned that, demand of irrigated water in the command area due to implementation of Buried Pipe and Pucca irrigation channels is fulfilled. But people from the catchments of 20 (39%) channels mentioned their demands were not fulfilled due to lack of sufficient irrigation channels or the quantity of water (65%) not sufficient to meet demands and the problem is further intensified due to electricity interruptions.

Advantage of the Locality due to Implementation of Barind project: For implementation of Barind project local people are getting advantage of crop diversification (82%). Farmers are benefited economically as income increased (24%), increase of job opportunities (16%). Water is available (16%), reduced wastage of water (14%). Quality of life improved (12%). Other important facilities are, increased tree plantation (6%), increased domestic animal rearing (4%), increased fish production (2%), reduced wastage of land (8%), reduced maintenance costs (4%), increased command area (6%), increased rate of literacy (2%) and supply of adequate drinking water (2%).

Current Status of Deep Tube Well (DTW): About 41% of the deep tube wells were installed before project period, 55% during project period and 4% after project period. In 47% cases tower is constructed with the deep tube well. Of these, 87% of the DTW towers are currently in good condition; but in case of the rest 13% DTWs, the upper portions of the towers are damaged. Out of 48 observed deep tube well, 13 (27%) discharges 1 cusec and 35 (73%) discharge 2 cusec water per minute/sec. Out of 48 observed deep tube well, 38 (79%) deep tube wells supply sufficient water and the rest 10 (21%) deep tube wells do not supply sufficient water. Due to faults in the equipment, water supply is being disrupted since ground water layer is falling below normal pumping level, and above all, low voltages are the reasons of not lifting sufficient water from the deep tube well. Out of 48 deep tube wells, 43 (90%) are functioning well and the rest 5 (10%) are not functioning well. All deep tube wells in Naogaon district are functioning well but in Rajshahi district 75% of the DTWs are poor.

Status of maintenance: Information collected on the status and sources of maintenance indicate that all deep tube wells (48) and irrigation channels (51) are maintained, but such maintenance is not under a regular routine system but on ad-hoc basis, i.e., as and when need basis (96%). The Water Users Caretaker and Scheme Committee play vital role in the repair and maintenance of tube wells and the irrigated water channels. The costs for such maintenance and repairs of the deep tube wells and water channels are mostly borne by the Scheme Committee and the beneficiaries. Out of 51 irrigation channels, people from the catchments of 49 (96%) irrigation channels mentioned that BMDA supervise deep tube well/irrigation channels properly. But the Drain men and tube well operators often succumb to the following problems, such as disruptions of electricity (22%), insufficient water supply (6%), pressures exerted by the farmers to supply water in their chosen fields (6%), damaged irrigation channels (12%), and number of drains fewer than actual need (6%).

Recommendation: People from the catchments of irrigation channels (Buried pipe/pucca) gave specific suggestions for improvements of supply of irrigated water:

- Increased coverage of irrigation channels (41%);
- Uninterrupted supply of electricity (29%);
- Cover the remaining areas of Barind under irrigation (18%);
- Buried Piped channels to be constructed with 10'' diameter pipe and valve (8%)
- Improved communication system in the Barind command area (4%)

Section 9: Findings of Local level Workshop

Background of the Workshop, Place and Date: As a requirement of the study, a local level workshop to assimilate the stakeholders' direct opinions on "Barind Command Area Development and Training Project" was organized and conducted by Research Evaluation Associates For Development Ltd.(READ), with the technical guidance of Implementation Monitoring and Evaluation Division (IMED), Ministry of Planning at the project area, BMDA Hall Room, Puthia Upazila, Rajshahi District, on 27/12/09. Secretary, IMED, Mr. Md. Abdul Malek was the chief guest while Chairman, Barind Multipurpose Development Authority (BMDA), Mr. Nurul Islam Thandu, was the special guest of the workshop. Director, IMED, Mr. Md. Abdul Quiyum presided over the workshop. A total of 53 persons participated in the workshop and they are:

- Beneficiary Farmers 25: Males (20) and Females (5) from Puthia, Charghat, Godagari, Mohonpur;
- IMED Officials 7: Secretary, Director, Dy. Directors, Asstt. Director, Evaluation Officer from IMED
- BMDA Officials 7: Chairman, Executive Director, Superintending Engineer and Project Director, Executive Engineer, Assistant Engineer
- Upazilla Level Other Officials 5: UNO, Project Director, BWDA, Agriculture Officer, Livestock Officer, Deputy General Manager, Rural Electricity Office from Puthia
- Local Journalist 1
- READ Officials 8: Managing Director, Consultant, Addl. Director Deputy Director, Assistant Director

Inaugural Session: Managing Director, READ, Dr. Syed Jahangeer Haider, delivered welcome address and outlined objectives of the evaluation study, its scope and methodology. He pointed out that his organization, READ, has completed the household's survey, intensive interviews, Physical Verifications of BMDA's irrigation infrastructures and other relevant tasks of data collection from the field. Data collected from this workshop will be compared with already collected data from the field and report will be finalized accordingly. Dr. Haider urged the participants to be candid and give their opinions openly on the project performances, and help READ to undertake effective analyses for the evaluation study with valid and comprehensive data.

Upazilla Nirbahi Officer, Quazi Anwar Hussain, opined that follow up and maintenance work of the programs and installations need to be intensified and project implementation should have more liaison with local administration. He also opined that the evaluation study undertaken would always require a baseline data to measure success comparing the pre and post project implementation; but he was not certain whether such data existed.

Executive Director, BMDA, Mr. S. M. Abdul Mannan asked the Upazilla Administration to participate in the workshop and facilitate free frank discussions in the workshop so that findings from the workshop reflect objective achievements of the BMDA project.

Chairman, BMDA, Mr. Nurul Islam Thandu, observed that before implementation of "Barind Project", this area was almost a desert and now it has turned into a green area and producing more than two crops. He claimed that 50% crops of the country is now produced in Barind area. Chairman, BMDA, however, urged upon the specialists to remain alert about the falling water level in the project area for taking necessary precautionary actions to combat further deterioration of the situation.

Mr. Md. Abdul Malek, Secretary, IMED emphasized raising the literacy level of the Barind area population. He highly appreciated the Barind project activities, but at the same time

asked the participants in the workshop to furnish honest opinions about the performances of the project providing valid and accurate data. Because the purpose of the local Workshop was to elicit concerned opinions of the local stakeholders and thereby contribute to a evaluation study. Then he declared the workshop open.

Director, IMED, Mr. Md. Abdul Quiyum, in his address as President in the Inaugural Session of the workshop urged upon all to perform their respectively assigned roles and make the workshop participatory and effective. He thanked the Secretary, IMED, and others present for attending the workshop.

Working Session: The Working Session was moderated by Mohammad Abdul Ghani and Santosh Kumar Sarker, Consultants, READ and they used pre structured guideline specifying major issues concerning implementation of the Project: Barind Command Area Development and Training Project. The discussions during the sessions elicited very live participation of the beneficiary farmers—males, females and large, small and marginal farmers. Threadbare discussions took place in the workshop pointing out the benefits and damages/difficulties created by the concerned project operation which is summarized below:

Positive Impact

- Previously the command area was almost a desert, drought prone; now it is green with trees, plants.
- Due to construction of irrigation channels—buried pipe and pucca, wastage of irrigated water has been reduced from previous 40% to 20%-25% now.
- Previously 2 hours time was required for irrigating water to reach 2000 feet distance, now it reaches there in no time (quickly) due to the implementation of the current project structures.
- Only one Deep Tube Well connected with 10 outlets irrigate 200 bighas of land;
- Before implementation of the project 60/70 bighas of land was possible to be cultivated with irrigated water. Previously, out of 200 bighas, 60/70 bighas used to be covered by kaccha channels, but now entire 200 bighas are covered by buried pipe and pucca irrigation channel.
- Agricultural production has been staggered under a system, which now helps to grow rice in low land, onions in high land and potato, wheat, maize in plain land.
- In the Command area of Barind project, now 3 crops are harvested. Moreover, extended areas are eventually being brought under cropping. As for example, some 600 bighas of land is now brought under production in place of previous 100 bighas in one tract of land. In addition, crops like rice, potato, wheat, maize, are grown there.
- Food deficiency in the area has decreased.
- Due to irrigation, now 38 maunds of rice is produced per bigha in place of 15 maunds previously.
- High breed rice is now produced in Barind project area in place of local verities.
- Some people with marginal land ownership used to work in others houses, now they cultivate their land with irrigation water and sell on an average 20 maunds of rice per bigha after meting their need.
- Production cost of irrigating water is now reduced. 300 bighas are now cultivated with the costs incurred earlier for cultivating 200 bighas of land. Earlier, water used to flow from mud made drains and such flow of water is to cause overflow (inundation) of the targeted land, thereby damaging it and making it unfit for crop production. Now there is no damage like this due to deep tube well and pied and pucca irrigation channels.
- Selected conscientious farmers (2-5 per village) were trained on the operations, management and maintenance of the irrigation installations including appropriate use of irrigated water. These trainee farmers in their turn trained other groups of farmers in the communities under the Command Area. As a result, production of crops increased to a substantial extent in the project area.

- Besides, due to availability of water from irrigation, enough fish is produced in the area through fish culture. Livestock production has also increased as enough fodder is available; crop straw used as fodders for livestock.
- Tree plantation increased a lot through social forestry development programs.
- Employment opportunities have been created in the project area.
- With the increase of income, enrolment for education has increased.
- Wages of labor increased more than before.
- The socio-economic standards the of population in the Barind project area improved.
- Different types of demands for a improved life increased in the project area.

Negative Impact

- The women participants in the workshop complained that they were and are now deprived of the irrigation facilities and a few who obtained it had to struggle for it. They also complained they are provided with earning opportunities due to implementation of the project.
- Maintenance and repairs of irrigation channel, drain, connecting pipe, it's joints, etc. are not properly done in due time although in some cases it is done within a week or so by BMDA and committee.
- Local Upazilla administration is not directly involved in the program.
- The water level has gone 20 feet down due to year round pumping of water through deep tube wells. It is suspected that ground water table may even fall by another 10 to12 feet.
- Irrigation water is not available in some places during dry season.

Ending of the Workshop

The program came to an end with thanks given by the Managing Director, READ, Dr. Syed Jahangeer Haider to all participants and guests.

Recommendations: Following points emerged out of the local workshop:

- The women participants demanded equal employment and earning (wages) opportunities in future in the Barind Project.
- Local Administration is to be involved in project operations/ management.
- Coverage of underground pipes to be extended further.
- In future, BMDA need to prioritize maintenance and repair of deep tube wells, irrigation channels under a comprehensive plans, so that repairs are not undertaken as and when needed basis instead on the basis advance planning integrated with proper supervision and monitoring activities
- Immediate large scale interventions are needed to prevent continuous falling of the water level in the Barind area.
- Every year, 3 day training program will benefit the people, if it is planned and implemented covering all the areas under a systematic schedule.
- Training on production (technological support and know how) of vegetables including onion, potato, brinjal need to be conducted.
- More women to be included in the training programs.

Section 10: Socio Economic Benefits Accrued

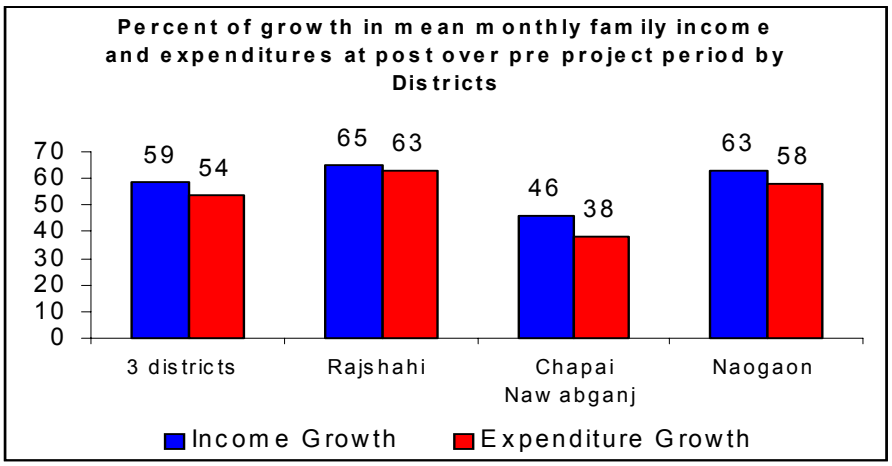
Poverty Reduction

Barind interventions on adequate supply of irrigated water preventing wastage accelerated agricultural productions, which in turn impacted directly on income escalation. The estimates on monthly family income were obtained from the Male Adult Farmers (household respondents). Accordingly, the mean monthly family income of the household, 5 years prior to data collection or during (within the first year) initial periods of project implementation (considered comparable as before project implementation) was Tk. 6102, while after project implementation, i.e., in 2009 (Year of IMED Evaluation Survey), the mean monthly family income of the household increased to Tk. 9715, an additional increment of 59%. Similarly, the mean monthly family expenditures of the household, 5 years prior to data collection was Tk. 4992, while after project implementation, the mean monthly family expenditures of the household increased to Tk. 7691, an additional increment of 54% (see table 21 and Bar graphs).

Table 21: Distribution of monthly family income & expenditure (in Tk.) by districts and by pre and post project periods

Income and Expenditure	All 3 districts: n-4800	
	Pre project	Post project
For 3 districts Income	6102	9715
Rajshahi	5655	9336
Chapai Nawabganj	6225	9105
Naogaon	6386	10384
For 3 districts expenditures	4992	7691
Rajshahi	4397	7154
Chapai Nawabganj	5449	7525
Naogaon	5195	8221

Highest income growth has been achieved in Rajshahi (65%), followed by Naogaon (63%) and in Chapai Nawabganj (46%) in that order. Similarly, the most increase in expenditures has again been performed by Rajshahi (63%), followed by Naogaon (58%) and in Chapai Nawabganj (38%) in that order.



Proportion of Income by Heads and by Pre and Post Project

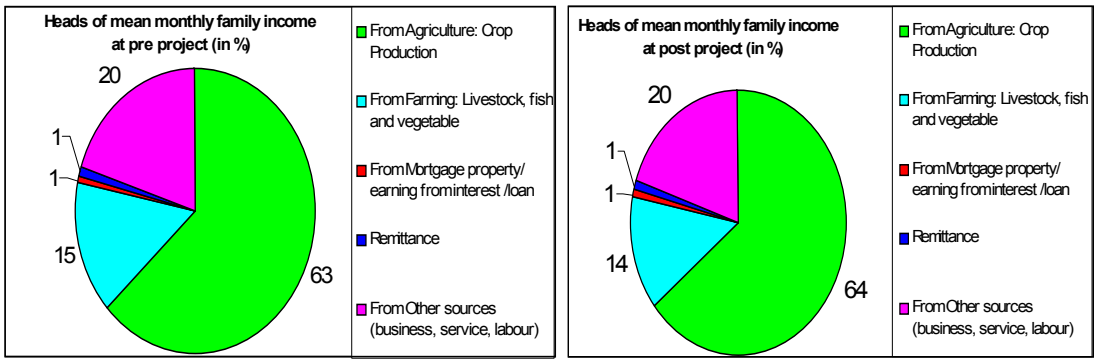
The mean income per family per month from:

- Agriculture was Tk. 3879 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 6158;
- Farming: Livestock, fish and vegetable was Tk. 927 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 1398;
- Mortgage property/ earning from interest /loan was Tk. 73 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 134;
- Remittance was Tk. 23 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 75;
- Other sources: business, service, labour was Tk. 1199 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 1951;

Table 22: Monthly family income pre and post project periods

Mean monthly family income by heads (in Taka)	Pre	Post
From Agriculture: Crop Production	3879	6158
From Farming: Livestock, fish and vegetable	927	1398
From Mortgage property/ earning from interest /loan	73	134
Remittance	23	75
From Other sources (business, service, labour)	1199	1951
Total Monthly income (in Taka)	**6102**	**9715**

Pie charts below the proportional distribution of the heads income comparatively by pre and post project periods.



The pie charts show that the sources of income proportionally are comparable at pre and post project periods. This means that although the family income increased substantially by amount of taka earned, but the sources of income remained static reflecting that the people are benefited by the Barind interventions greatly. Their substantially increased income gains from agriculture and farming as a consequence of the intervention did not inspire them to seek other means of income; instead they were encouraged to invest more on agriculture and farming, even diversifying the technology and crop production. People when do not find enough income from their traditional sources look for innovative and new initiatives, but in Barind even income from remittances, mortgages and business remained unchanged over about a decade.

Estimates of net Monthly Family Income: The mean monthly family income per household was Tk. 6102, while after project implementation, i.e., in 2009 (Year of IMED Evaluation Survey), the mean monthly family income per household increased to Tk. 9715, an additional increment of 59%, which is with inflationary effect. However, the net increase in monthly family income excluding inflation is 28%; hence the rest 31% (59%- 28%) is the

impact of inflation: estimates of net income calculated through comparative application of the price of Paddy comparatively for the years 2005 and 2009. According to BBS Household Income and Expenditure Survey 2005 the rural monthly family income for Bangladesh is as follows:

Table 23: Estimates of net monthly family income

Year	For Rural Bangladesh (BBS) in Taka		For Barind (READ) in Taka
	Amount in Tk.	% increase over preceding year	
2009 (Estimated)	7714		9715
2005 (BBS)	6095	26.56	
2000 (BBS)	4816		

The rural average monthly family income for Barind is 26% higher than that of the rural income for Bangladesh.

Proportion of Expenditures by Heads and by Pre and Post Project

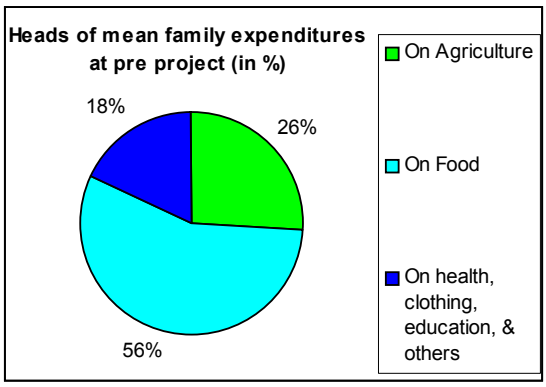
The mean expenditures per family per month on:

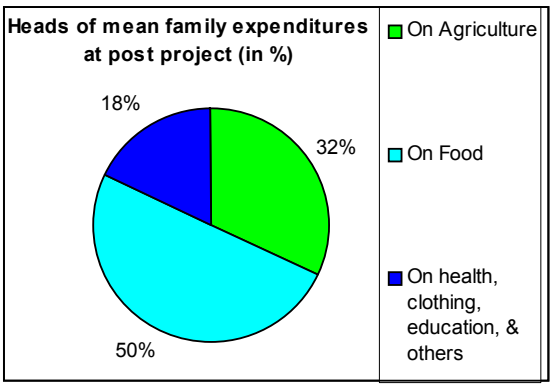
- Agriculture was Tk. 1411 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 2431;
- Food was Tk. 2801 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 3844;
- Health, clothing, education and others was Tk. 779 in pre project period in all the districts in Barind area, while during post project it increased to Tk. 1415;

Table 24: Monthly family expenditure pre and post project periods

Mean monthly family expenditure (in Taka)	Pre	Post
Agriculture	1411	2431
Food	2801	3844
Health, clothing, education and others	779	1415
Total expenditure	**4992**	**7691**

The pie charts show that the heads of expenditures proportionally are comparable at pre and post project periods and without changing.





That the heads of expenditures did not change is little bit alarming; because this means that although the expenditures in terms of amount of money spent increased but the priorities for expenditures remained unchanged. Income growth has not induced the families in Barind to prioritize more on health and education. This probably means that income increase does not automatically change people's attitudes towards the standard of living or quality of life without additional inducements, i.e. motivations for improving health and literacy levels.

Poverty Gap

The distribution of monthly family income by poor and non poor and also by pre and post project periods is shown in the table 24. Income has increased universally, i.e., both the poor and the non poor gained due to Barind interventions on preventing wastage of irrigated water and simultaneously accelerate agriculture productions for improved livelihood (income) per family.

Among the poor, Naogaon demonstrates highest income increase at post project period over the pre project: 53%, followed by Rajshahi (49%) and then Chapai Nawabganj (38%).

But among the non poor, Rajshahi demonstrates highest income increase at post project period over the pre project: 73%, followed by Naogaon (65%) and then Chapai Nawabganj (50%)

Table 25: Distribution of monthly family income (in Tk.) by poor non poor, districts and by pre and post project periods

Districts	All 3 districts: n-4800					
	Poor			Non Poor		
	Pre	Post	Additional % of growth during post over the pre project period	Pre	Post	Additional % of growth during post over the pre project period
Rajshahi	4024	6002	49	7127	12346	73
Chapai Nawabganj	4663	6417	38	7213	10805	50
Naogaon	3741	5729	53	8001	13225	65
Total	**4066**	**5995**	**47**	**7534**	**12332**	**64**

Poverty gap (income gap) at the pre project period was 85% while the gap increased to 106% at post project period.

Table 26: Intra period income gap by poor and non poor by districts: in %

Districts	At Pre Project Period: poor versus non poor	At Post Project Period: poor versus non poor
Rajshahi	77	106
Chapai Nawabganj	55	68
Naogaon	114	131
All 3 districts	**85**	**106**

Such increase in poverty gap (income gap) is the highest in Naogaon (From 114% at pre to 131% at post); followed by Rajshahi (From 77% at pre to 106% at post); and then in Chapai Nawabganj (From 55% at pre to 68% at post). In all the districts the rich became richer rather disproportionately meaning that the income increase is much more among the non poor compared to that among the poor at post project period. Findings on supply of irrigated water and the accompanying problems underscored the mal distribution in the supply system often influenced by rich farmers (and mastans).

Income by high and low performing areas

The table below shows the comparative income and expenditures by the high and low performing areas:

Table 27: Comparative income and expenditures by high and low performing areas and by pre and post project periods

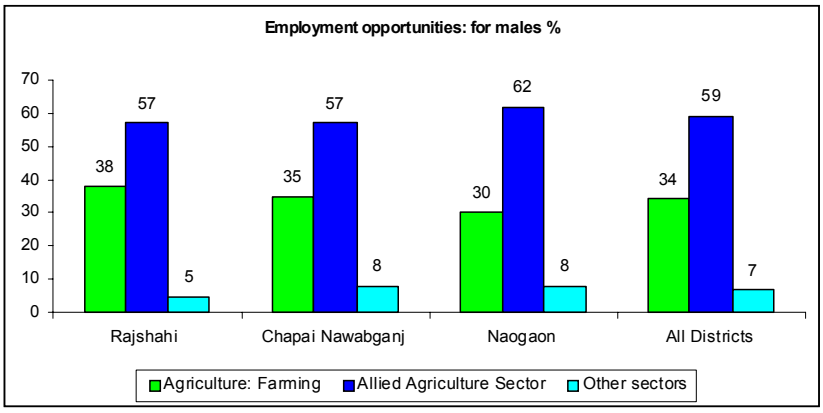
Income & Expenditure	All 3 districts: n-4800					
	Pre project			Post project		
	High	Low	Total	High	Low	Total
Mean Monthly Family income in Tk.	6200	6004	6102	9818	9613	9715
Mean Monthly Family expenditures in Tk.	5084	4900	4992	7742	7639	7691

Comparatively the mean monthly household income (family) in the high performing areas rose additionally by 58% at end of project implementation over the before or initial period of project implementation; but the same increased in case of the low performing areas additionally by 60%. Again comparatively, the mean monthly household expenditures (family) in the high performing areas rose additionally by 52% at end of project implementation over the before or initial period of project implementation; while the same increased in case of the low performing areas additionally by 56%.

It is evident that both income and expenditures in the project areas irrespective of high or low performing rose substantially (over 50%) comparatively at after over the before project implementation signifying positive impact of the project interventions, as most of the additional income was contributed through farming (see details in the presentation on Section on Agriculture).

Employment Opportunities

Almost universally, the male respondents in Rajshahi (98%), in Chapai Nawabganj (98%) and in Naogaon (88%) claimed that the employment opportunities increased during the Post Project Period.



Sectors contributing to opportunities for employment as shown in bar graphs above are:

- Allied Agriculture Sector: fish Cultivation, domestic animals and poultry raising and rearing, Tree plantation: 59%
- Agriculture Farming: Crop Productions (rice and wheat) and Vegetable Gardening: 34%

- Other Sectors: Construction (roads), Cottage Industries, Business, Service, Labor: 7%

Specifically, the employment opportunities for men increased in agriculture (100%), fish cultivation (70%), Afforestration (68%), cattle rearing (62%), chicken/duck rearing(52%), followed by soil digging(48%), vegetable gardening (47%), construction of roads/ bridges (24%), service (10%), small business (7%), and cottage industry, work in mills/ factories, others (4% each).

Employment opportunities for Women in the Allied Sector

On average, 78% of the women of Barind claimed that they have experienced increased employment opportunities at post project implementation period in the Agriculture and its allied Sector; however such claim has been made 95% of the women in Chapai Nawabganj followed by Naogaon (74%) and in Rajshahi (71%).

Table 28: Status of increase of employment opportunities for women in the allied Sector: in %

Status	Rajshahi n=400	Chapai Nawabganj n=300	Naogaon n=500	All sample districts n-1200
Yes	71	95	74	78
Employment opportunities by areas of involvement				
Chicken/duck rearing	76	68	89	79
Vegetable garden	53	36	35	41
Agriculture	22	72	21	37
Cattle rearing	35	50	26	36
Afforestation	24	21	12	18
Fish cultivation	12	16	5	10
Median increase	30	43	24	37

The median employment increase during post project period is in the six areas specified above is 37%; again in Chapai Nawabganj, it is 43%, while in Rajshahi, it is 30% and in Naogaon, it is 24%.

Chapter V
Strengths and Weaknesses of the Project

Major strengths of the project are that: 80% of the people of Barind were aware of the project; and they also prioritized the need for adequate proportions of irrigated water for their farm land without much system loss. Barind intervention through establishing distribution channels by buried piped water ensured minimum loss of irrigated water for the middle, small and marginal farmers. Barind tract was previously barren and was prone to drought and the living standards of the people were poor. Project interventions transformed the lives of the farmers and their support for the project was vital for its success.

Matrix on Strengths and Weaknesses on of Project

Strengths of the Project	Weaknesses of the Project
On Barind Infrastructures	
➢ 80% respondents were aware about Barind project. All the DTWs are connected by Piped (71%) and Pucca Channels (29%). Hundred percent of the farmers (respondents) use the irrigated water for farming. Irrigated water is used for production of High breed (9%), HYV (74%) and local varieties (17%). ➢ The proportional improvements in the coverage of irrigated land during post project over the pre project were 40% in Rajshahi; 56% in Naogaon and 49% in Chapai Nawabganj. ➢ In the perspective of definition as above, the farmers from both Rajshahi and Naogaon enjoy privileged status, as in these places, more than 80% said that irrigated water is distributed on rotation (on equity); But the scenario in Chapai Nawabganj is quite different, where only 52% said that irrigated water is distributed on rotation. ➢ **Status of use of Deep Tube Well Water:** Comparatively assessing the status of availability of water sufficiently or partially, the situation in Naogaon (97%) is the best followed by Rajshahi (92%) and next Chapai Nawabganj (85%). About 90% of the respondents did not face any problems related to channels (piped/pucca): Chapai Nawabganj (94%), Naogaon (89%), and Rajshahi (84%) ➢ Over ninety percent of the respondents irrespective of districts and high and low performing unions claimed that the level of wastage of water reduced substantially after establishment of the piped channel system. The mean reduction of the wastage of irrigated water was reduced by two thirds at post piped channel system compared to previous kaccha channel system. The highest reduction occurred at Rajshahi (34%); followed by Naogaon (22%) and Chapai Nawabganj it is only 13%.	➢ But 91% did not participate in the project implementation. Participation of the women was at 2.7% level. Only 49% of the plots are adjacent to the channels with highest level of access to irrigated water; 15% fall at the middle; while 36% of the plots are too far away; probably with comparatively less access to irrigated water. ➢ The farmers from both Rajshahi and Naogaon, 13% said that irrigated water is distributed on demand, not as a routine system; and 5% said that it depended on the decisions of the distributors. In Chapai Nawabganj irrigated water was distributed on demand (35%) and 13% on decisions by the distributors. ➢ Insufficiency of DT water is experienced primarily due to lack uninterrupted supply of electricity: Naogaon (58%), Rajshahi (65%), and Chapai Nawabganj (50%). The other reasons for shortfall of DTW vary by districts: ✓ Naogaon: Influential consuming excess water (14%); cover too many/large plots (13%); defaults of MC (8%); ✓ Rajshahi: Low level of water (16%); cover too many/large plots (6%); use of Kaccha channel (6%); and ✓ Chapai Nawabganj: Negligence of MC (15%); cover too many/large plots (15%); Influential consuming excess water (15%). ➢ Specific problems related to channels are as follows ✓ In Rajshahi the major problem is the broken status of the channel (51%), followed by lack of sufficient supply of water in the channel (20%); and distance of the plot from the channel (14%); ✓ In Chapai Nawabganj the major problem related to channels is the distance of the plot from the channel (36%); followed by lack of sufficient supply of water in the channel (15%) and obstructed flow of water through channels (15%); and ✓ In Naogaon the major problem related to channels is the obstructed flow of water through channels (32%); followed by distance of the plot from the channel (24%); lack of sufficient supply of water in the channel (17%) and the broken status of the channel (16%).

Strengths of the Project	Weaknesses of the Project
On Barind Infrastructures	
➢ Majority of the respondents (58%) claimed that the cost per unit (bigha) of irrigating water has reduced during post project implementation period compared to pre implementation. In the overall, the reduction of the costs for irrigated water per bigha is Tk 328 (30%) comparatively at post project implementation period over the pre project; however, the highest reduction of the costs have been experienced in Naogaon Tk. 373 (35%) followed by Rajshahi Tk. 322 (30%) and Chapai Nawabganj Tk. 224 (19%). ➢ In total, the current study has physically verified 29409 meters of channels (additional 896 meters verified), of which 20925 meters are piped channels and 8484 meters are pucca channels. Ninety one percent of the DTWs are found satisfactory; similarly 82% of the buried pipe channels were found satisfactory. ➢ In Naogaon, the costs of repair and maintenance of the DTWs are shared almost equally: Beneficiaries—37%; Care Takers—45%; and BMDA—34%. ➢ Majority of the respondents claimed that the repair and maintenance works of the DTWs are done at an appropriate time, i.e. before on set of the cropping seasons/on the eve of using water (58%) ➢ As regards the channels (piped and pucca), nearly two thirds (64%) of the respondents claimed that the repair and maintenance works are carried out at an appropriate time ➢ In Rajshahi 64% said that the WMCs provide advice or assist in solving problems and 55% of the respondents are satisfied with performances of the WMCs. In Naogaon 81% said that the WMCs Supply and Distribution of Water solving problems and 65% of the respondents are satisfied with performances of the WMCs. In Chapai Nawabganj 68% said that the WMCs ensure maintenance and repair of deep Tube-well and irrigation channels and there 56% of the respondents are satisfied with performances of the WMCs. ➢ At the local level, Water Management Committee (WMC: Scheme Committee) comprises beneficiary representatives, care Takers/Operators, Drain man, and representative of BMDA (when available). About three fourths (72%) in Rajshahi, less than half in both Chapai Nawabganj (46%) and in Naogaon 43% are aware of the WMCs.	➢ One of the important reasons for comparatively low proportion of reduction of wastage of water in Chapai Nawabganj is lack of awareness on the need for reducing wastage (27%), while in Rajshahi (28%) and in Naogaon (16%), it is due to water being transferred to others land, while other major reason is the existence of the kaccha channel. ➢ Most the pucca channels (57%%) was found unsatisfactory. As regards pucca channels, the conditions are worse in Rajshahi (70% unsatisfactory; while in Naogaon and in Chapai Nawabganj, 50%, in each, are either satisfactory or unsatisfactory. About a fifth of the Piped channels (22%) in Naogaon was unsatisfactory. ➢ Most of the costs for repair and maintenance of the DTWs and the channels are borne by the beneficiaries: 60% in respect of DTWs and 62% in respect of the channels. ➢ Nearly half of them (42%) claimed that for the repair and maintenance, there is no fixed time, it is done year round. But a third of them (36%) claimed that there is no fixed time for the same. ➢ 45% in Rajshahi, 35% in Naogaon, and 44% in Chapai Nawabganj are not satisfied with the performances of WMC. Respondents in both Rajshahi (57%) and Naogaon (59%) emphasized on activating the WMCs through regularly holding meetings (once in a month) and also desiring that the WMCs would function with consensus and without influence; while the respondents in Chapai Nawabganj (59%) prioritized raising awareness of the WMC members on their appropriate responsibilities and functions through training. ➢ Only one tenth of the respondents underscored the need for supervision and monitoring by WMC; and only a meager percent of the respondents (4%) emphasized on the needs for undertaking repair and maintenance works by the WMC. ➢ 28% in Rajshahi, 54% in Chapai Nawabganj and 57% in Naogaon are not aware of the WMCs.

Strengths of the Project	Weaknesses of the Project
Training Effectiveness	
➢ 30,000 people at the project area were trained. ➢ Training of ideal farmers covered 9 major topics: Collection of improved seeds and identify its quality (39%); Crop diversification/ production of more crops (73%); Proper use of fertilizer and pesticides (58%); Proper use of water on land (10%); Seedling plantation (4%); Prevention of weeds on land (4%); Prevention of insecticides on the land (2%); Prevention waste of irrigation (1%); and Rearing of domestic animal (7%). ➢ Training of Tube well Operators/ Drain men/ Coupon Dealers covered 7 major topics: Installation of deep tube wells (76%); Ensuring proper supply of water from DTWs (59%); Prevention of wastage of water from shallow tube well (26%); Mechanical Functioning of deep tube wells (20%); Enlistment and Distribution of coupon (2%); On alternative energy use (diesel) in absence of electricity (2%) and Cleaning the channels (2%) ➢ Different types of training materials were used in the training sessions. Among the materials used were: Black Board, Marker/Pen, Khata, Manual, Posters, Files, Chalk, Duster, Leaflet, Flip charts and demonstration equipment for repair of tube wells. ➢ According to the trainees', the level of knowledge, skills on imparting training of the trainers were very good (25%), and good (64%). On the other hand, level of quality of the training was very good (18%), good (56%). ➢ 68% of the trainees opined that class room environment and sitting arrangements in the training session was good; 43% of the trainees mentioned that quality of food served to the trainees was good; 36% mentioned that transport facility was good; and 36% of the trainees mentioned that use of training materials in the training sessions were good. ➢ About two thirds of the trainees assessed 'Improved Practices on Land use and farming/improved Agriculture: 67%' and 'Crop diversification: Increased knowledge, skills and practices: 61%' as effective during post training periods. ➢ 53% trainees assessed the current duration of training as adequate. ➢ 71% trainees opined that the training curricula used was comprehensive.	➢ Only 10% trainees received practical training on operation of deep tube well, preservation of improved seeds, plantation of paddy in the right way, preparing of seed bed, supervision and repairing of tube wells, and providing fertilizer according to the color of paddy leaf. ➢ According to the trainees', the level of knowledge, skills on imparting training of the trainers were moderate (12%) and bad (1%). On the other hand, level of quality of the training was moderate (25%) and bad (1%). ➢ 32% of the trainees opined that overall class room environment and sitting arrangements in the training session was not good; 66% of the trainees opined that there were no residential accommodation facilities for the trainees. 57% trainees mentioned that quality of food served to the trainees was not good; More than one third of the trainees (38%) mentioned that there was no transport facility to attend the training sessions; and 64% of the trainees mentioned that use of training materials in the training sessions were not good. ➢ Interestingly, the primary objective of the Project was to prevent wastage of irrigated water, but less than half of the trainees (43%) assessed that their training on 'Improved use of irrigated water' as effective; may be in future this area needs further emphasis during training. ➢ 47% trainees reported that the duration of training was inadequate: trainees recommended on average 2 weeks' (11 days) training. ➢ 29% trainees viewed that the training curricula used was not comprehensive. ➢ 15% trainees could use their training on 'Other allied Agriculture/ Multisectoral Aspects', while about double the proportion (29%) recommended the same as future areas of emphasis: Fish cultivation (16%); Rearing of domestic animals (8%); Afforestation including fruit bearing trees (3%); and Cow fattening (2%).

Strengths of the Project	Weaknesses of the Project
Agriculture and Food:	
➢ Production: Overall food production increased by 68% in all the three districts during post project period over the pre project. Highest production level was achieved in Rajshahi, where the food production per bigha of land during the post project period over the pre project increased additionally by 80%, followed by Naogaon (66%) and Chapai Nawabganj (61%). ➢ 98-99% claimed that their performances on the frequencies of crop productions turned from mostly single crop production during pre project period (Single: 60%; Double 40% and Triple: 0%) to mostly multiple crop productions during post project period (Single: 1%; Double: 48%; and Triple: 51%). Frequencies of crop productions improved most substantially in Rajshahi, where the triple crop production increased from 0 to 66%; followed by Naogaon, where triple crop productions increased from 0 to 45% and in Chapai Nawabganj, it improved from 0 to 38%. ➢ Cropping intensity has increased by 122% (from 131% to 253%) in high performing area and 118% (from 133% to 251%) in low performing area. The increase in cropping intensity was the highest in case of Rajshahi district (from 148-153% to 260-281%). The cropping intensity gradually (day by day) increased from 131% in the pre project period to 253% in the year 2009, which is higher than the DAE crop intensity level (207 -234% under 3 districts) reported in 2009. ➢ Overall crops production increased annually and the increased scenarios are in: Boro (223.85%), Vegetables (186.40%), Aus (105%), Sugarcane (101.51%), Pulses (95.92%), Mustard (82.52%) and Wheat (81%) at post project period.	➢ Findings indicate decreasing the trends in the application of manures (such as cow dung, compost) after intervention of project. About 55-80% respondents before project applied high amount of manures; whereas, only 23-40% respondents used high amount of manures i.e. about 50% manure usage declined. ➢ Majority of the respondents (61-85%) expressed that insect and disease infestation was less before implementation of the Barind project. Whereas, 75-92% farmers opined that insects and disease infestation were high after implementation of the project. It may be due to change of cropping pattern from mono crop to cultivation of multiple crops. Further, introduction of Hybrid and HYV crops as well as availability of crops throughout the year has created favorable condition for increasing pest population. The findings of study clearly indicated that insects and disease infestation continuously increasing after intervention of project.

Strengths of the Project	Weaknesses of the Project
Allied Agriculture Sector Effectiveness	
➢ Participation to fish production during post project periods was above 90% ➢ Participation to poultry production was above 90% ➢ Participation to livestock rearing was above 80%	➢ Negative environmental impacts according to the respondents were caused by reduced fertility of the land, because of use of chemical fertilizers (35%); increased insect and disease infestation (28%); disease borne by mosquitoes/flies increased (20%); and pisciculture blocking flow of open water (4%). ➢ The water level has gone down by 20 feet due to year round pumping of water through deep tube wells. It is suspected that ground water table may even fall by another 10 to12 feet.

Strengths of the Project	Weaknesses of the Project
Socio Economic Benefits	
➢ The mean monthly family income of the household at pre project was Tk. 6102, compared to Tk. 9715 at post project, an additional increment of 59%. Similarly, expenditures per family per month was Tk. 4992 and at post project period it was TK. 7691, an additional increment of 54%. ➢ Income increased universally, i.e., both among the poor and the non poor gained due to Barind interventions on preventing wastage of irrigated water and simultaneously acceleration of agriculture productions leading to improved livelihood (income) per family. ➢ Almost universally, the male respondents from households affirmed that employment opportunities increased by 98%, each in Rajshahi and in Chapai Nawabganj, while in Naogaon, it increased by 88% at the Post Project Period. ➢ Specifically, the employment opportunities for men increased in agriculture (100%), fish cultivation (70%), Afforestration (68%), cattle rearing (62%), chicken/duck rearing (52%), followed by soil digging (48%), vegetable gardening (47%), construction of roads/ bridges (24%), service (10%), small business (7%), and cottage industry, work in mills/ factories, others (4% each).	➢ Poverty gap (income gap among the poor and the non poor) at the pre project period was 85% while the gap increased to 106% at post project period. Such increase in poverty gap (income gap) is the highest in Naogaon (from 114% at pre to 131% at post); followed by Rajshahi (from 77% at pre to 106% at post); and then in Chapai Nawabganj (from 55% at pre to 68% at post). In all the districts the rich became richer rather disproportionately meaning that the income increase is much more among the non poor compared to that among the poor at post project period. Findings on supply of irrigated water and the accompanying problems underscored the mal distribution in the supply system often influenced by rich farmers (and mastans). ➢ The women participants in the workshop complained that they were and are now deprived of the irrigation facilities and a few, who obtained it, had to struggle for it. They also complained that they are provided with least earning opportunities due to implementation of the project.

Chapter VI
Recommendations: Conclusion: Sustainability

Recommendations of Trained Farmers

- Repeat and refreshers' training (40%)
- More practical training (39%)
- Training on modernized cultivation (28%)
- Increased duration of training (13%)
- Train every farmer of the village (7%)
- Provide training allowances (4%)
- Equip the farmers with some tools (3%)
- Furnish the farmers with printed materials on improved farming (3%)
- Extension and improvement of training curricula covering
    - ✓ Modern cultivation and methods (61%)
    - ✓ Repair and maintenance of deep tube well (50%)
    - ✓ Improved seeds (9%)
    - ✓ Use of fertilizer and pesticides (5%)
    - ✓ Vegetable cultivation (3%)
    - ✓ Prevention of plant diseases (2%)
    - ✓ Wheat cultivation (2%)
    - ✓ Improving intensity of cultivation on small plots of land (2%)

Recommendations of Local Stakeholders

- The women participants demanded equal employment and earning (wages) opportunities in future in the Barind Project. More women to be included in the training programs.
- Local Administration is to be involved in project operations/management.
- Coverage more plots of land by underground pipes to be ensured further.
- In future, BMDA need to prioritize maintenance and repair of deep tube wells, irrigation channels under a comprehensive plan, so that repairs are not undertaken as and when need basis, instead on the basis of advance planning supported by proper supervision and monitoring programs.
- Urgent and large scale interventions are needed to prevent continuous falling of the water level in the Barind area.
- Every year, at least a week's training program will benefit the people, if it is planned and implemented covering all the areas under a systematic schedule.
- Training on production (technological support and know how) of vegetables including onion, potato, brinjal need to be further strengthened.

The most priority concern expressed by the people of Barind is the current status of severe decline in the ground level water, and the urgent need is to address this problem so that water level does not decline further. As an alternative, the suggestion is to initiate interventions in Barind area for mass level participation for preservation of rain water.

Study Recommendations:

- Increase employment and earning (wages) opportunities for women in future
- Involve Local Administration in project operations/management
- Extend coverage of cultivable land by underground pipes
- Prioritize maintenance and repair of deep tube wells, irrigation channels under a comprehensive plan
- Immediate interventions needed to prevent continuous falling of the water level in the Barind area
- As an alternative, initiate efforts on preservation of rain water
- Every year impart one week's training to the community farmers—males and females
- Curricula of training to include lessons emphasizing 'proper use of irrigated water and prevention of wastage'
- Training to focus on crop diversifications: vegetables, onion, potato

Sustainability

Objectives of the project envisaged improvements of the structures supplying irrigated water to farm lands in the Barind tract: Rajshahi, Chapai Nawabganj and Naogaon. As a consequence, the expected outcome was that agriculture productions would accelerate (both coverage and intensity of productions), and in turn, people would earn more and their living standards would improve. Following findings suggest that much of these expectations of the people have been meet successfully. Following specific outcomes of the project reflect the efficiencies and effectiveness of Barind Project:

- 70% of the respondents affirmed that their plots of land are covered by irrigated water: Chapai Nawabganj (81%), Rajshahi (67%) and Naogaon (62%).
- Wastage of irrigated water reduced by two thirds at post piped channel system compared to previous kaccha channel system: the highest reduction was in Rajshahi (34%); followed by Naogaon (22%) and Chapai Nawabganj, it is only 13%.
- Comparatively low proportion of reduction of wastage of water in Chapai Nawabganj was the lack of awareness on the need for reducing wastage (27%), while in Rajshahi (28%) and in Naogaon (16%), it was due to water being transferred to others lands, and the other major reason is the existence of the kaccha channels.
- Operational status of 90% DTWs are satisfactory; similarly 82% of the buried pipe channels are satisfactory, but only 43% of Pucca channels are satisfactory; conditions are worse in Rajshahi (70% unsatisfactory); in Naogaon and in Chapai Nawabganj, roughly 50% are either satisfactory or unsatisfactory. About a fifth of the Piped channels (22%) in Naogaon are unsatisfactory.
- 58% respondents claimed that the repair and maintenance works of the DTWs are done at an appropriate time; 42% claimed that for the repair and maintenance, there is no fixed time and schedule. Most of the costs for repair and maintenance of the DTWs and the channels are borne by the beneficiaries: 60% in respect of DTWs and 62% in respect of the channels. But in Naogaon, the costs of repair and maintenance of the DTWs are shared almost equally: Beneficiaries—37%; Care Takers—45%; and BMDA—34%.
- Food production increased by 68% in all the three districts during post project period over the pre project. Highest production per bigha of land increased in Rajshahi by 80%, followed by Naogaon (66%) and Chapai Nawabganj (61%) during the post project period.
- 98-99% household respondents claimed that frequencies of crop productions turned from mostly single crop during pre project period (Single: 60%; Double 40% and Triple: 0%) to mostly multiple crop productions during post project period (Single: 1%; Double: 48%; and Triple: 51%).

- Crop productions improved most substantially in Rajshahi, where the triple crop production increased from 0 to 66%; followed by Naogaon, where triple crop productions increased from 0 to 45% and in Chapai Nawabganj, it improved from 0 to 38%.
- Cropping intensity gradually (day by day) increased from 131% in the pre project period to 253% in the year 2009, which is higher than the DAE crop intensity level (207 -234% under 3 districts) reported in 2009.
- Income has increased universally among both poor and non poor. Among the poor, Naogaon demonstrates highest income increase at post project period (53%) over the pre project, followed by Rajshahi (49%) and then Chapai Nawabganj (38%).
- Among the non poor, Rajshahi demonstrates highest income increase at post project period (73%) over the pre project, followed by Naogaon (65%) and then Chapai Nawabganj (50%).
- Pre project poverty gap (income gap among the poor and the non poor) of 85% increased to 106% at post project period. Such increase in poverty gap (income gap) is the highest in Naogaon (From 114% at pre to 131% at post); followed by Rajshahi (From 77% at pre to 106% at post); and then in Chapai Nawabganj (From 55% at pre to 68% at post).
- In all the districts the rich became richer rather disproportionately meaning that the income increase is much more among the non poor compared to that among the poor at post project period. Findings on supply of irrigated water and the accompanying problems underscored the mal distribution in the supply system often influenced by rich farmers (and mastans).
- The heads of expenditures proportionally are comparable both at pre and post project periods and without changing. That the heads of expenditures did not change is little bit alarming; because this means that although the expenditures in terms of amount of money spent has increased, but the priorities for expenditures remained unchanged. Income growth has not induced the families in Barind to prioritize health and education more, and it remained at 18% both during pre and post project periods. This probably means that income increase does not automatically change people's attitudes towards the standard or quality of life without additional inducements, i.e. motivations for improving health and literacy levels.
- Almost universally, the male respondents in Rajshahi (98%), in Chapai Nawabganj (98%) and in Naogaon (88%) claimed that the employment opportunities increased during the Post Project Period.
- Women participation in Barind Project remained marginal; they are largely deprived of access to irrigated water and also on employment opportunities.

Conclusion: Barind Project is a sustainable and a successful story. Barind is also a priority program of the people. It has not only transformed their farmland from barren fields to lush green agricultural land with substantial increase in their income leading to improvements in their livelihood. But a few areas like systematic repairs and maintenance of the irrigation structures; changing pucca or kaccha channels into buried pipes; coverage of more plots by buried pipes; reducing income gaps among the poor and non poor, and lastly encouraging more women to participate in Barind are future imperatives for ensuring more success for the project.

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Appendix—1

Detailed Tables of Household Level Findings

Table 1: Socio-demographic and Economic Information of respondents (Adult Male Farmers)

Variables	Rajshahi n=1600	Chapai Nawabganj n=1200	Naogaon n=2000	All sample districts n-4800
Mean age(yrs)	41	44	40	42
Minimum: Maximum:	20 82	20 74	20 85	20 65
Mean education (class passed)	4	3	5	4
Marital status (in %)				
Currently married	100	99	99	99
Others (widow/widower/Divorced)	0	1	1	1
Mean no. of family member	6	7	6	6
Type of family (in %)				
Single	74	78	70	73
Joint	26	22	30	27

Table 2: Primary occupations of Adult Male Farmers pre and post project periods: in %

Primary occupations	Rajshahi n=1600		Chapai Nawabganj n=1200		Naogaon n=2000		All sample districts n-4800	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Engaged in agriculture	98	99	92	98	95	94	96	96
Business	1	1	6	1	3	5	3	3
Service	1	0	2	1	2	1	1	1
Total	100	100	100	100	100	100	100	100

Table 3: Comparative income by high and low performing areas and by pre and post project periods

Mean monthly family income by heads (in Taka)	Rajshahi n=1600						Nawabganj n=1200						Naogaon n=2000					
	Before			After			Before			After			Before			After		
	H	L	T	H	L	T	H	L	T	H	L	T	H	L	T	H	L	T
From Agriculture: Crop Production	4018	3835	3927	6515	6193	6354	3411	3182	3297	5124	4870	4997	4196	4184	4190	6682	6712	6697
From Farming: Livestock, fish and vegetable	632	676	654	1050	1159	1105	1438	1299	1368	1840	1784	1812	815	948	881	1271	1495	1383
From Mortgage property/ earning from interest /loan	38	67	52	68	119	93	107	90	98	218	169	193	86	66	76	127	137	132
Remittance	0	20	10	24	44	34	49	74	61	163	172	167	15	7	11	77	27	52
From Other sources (business, service, labour)	1072	953	1013	1925	1576	1751	1414	1385	1399	1921	1950	1935	1310	1146	1228	2181	2061	2121
Total Monthly income (Tk.)	5760	5550	5655	9582	9091	9363	6418	6031	6225	9264	8946	9105	6422	6351	6386	10338	10430	10384

H=High; L= Low; T=Total

Table 4: Comparative expenditures by high and low performing areas and by pre and post project periods

Mean monthly family expenditure by heads (in Taka)	Rajshahi n=1600						Nawabganj n=1200						Naogaon n=2000					
	Before			After			Before			After			Before			After		
	H	L	T	H	L	T	H	L	T	H	L	T	H	L	T	H	L	T
Investments for Crop cultivation	1477	1448	1463	2695	2565	2630	1381	1229	1305	2037	1833	1935	1468	1400	1434	2501	2639	2570
Food purpose	2253	2243	2248	3283	3258	3270	3355	3167	3261	4256	4078	4167	3007	2928	2967	4105	4115	4110
Costs of treatment, clothing, education schools, transportation, electricity/ gas/ kerosin, mobile ph bills, festivals etc.)	674	698	687	1230	1277	1253	917	849	882	1432	1413	1422	812	773	794	1574	1507	1540
Total Monthly Expense(Tk.)	4404	4389	4397	7209	7099	7154	5653	5245	5449	7725	7325	7525	5287	5102	5195	8181	8261	8221

H=High; L= Low; T=Total

Table 5: Respondent's perception on starting the implementation of Barind Command Area Development and Training Project: in %

Status	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	89	87	88	85	84	84	74	69	72	82	79	80
No	11	13	12	15	16	16	26	31	28	18	21	20
Total	100	100	100	100	100	100	100	100	100	100	100	100

H=High; L= Low; T=Total

Table 6: Respondent's opinion on formation local committee during construction of irrigation channels: in %

Status	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	91	88	89	54	58	56	59	58	58	68	68	68
No/not aware	9	12	11	46	42	44	41	42	42	32	32	32
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 7: Respondent's opinion on properly construction of pipe/pucca irrigation channels of Barind Project: in %

Status	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	89	85	87	74	80	77	79	77	78	81	81	81
No /not aware	11	15	13	26	20	23	21	23	22	19	19	19
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 8: Respondents' perception on length (meters) of the irrigation channel in their village

Mean Length (meters)	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Mean length of Burried Pipe Irrigation Channel	644	608	622	610	599	603	609	610	610	621	606	614
Mean length of Pucca Irrigation Channel	616	608	613	588	610	596	610	604	608	605	607	606

Table 9: Perception on increasing irrigation land to implement the Barrind Project: in %

Status	Rajshahi n=1600			Chapai Nawabganj n=1200			Naogaon n=2000			All districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	69	66	67	82	80	81	62	62	62	71	69	70
No	31	34	33	18	20	19	38	38	38	29	31	30
Total	100	100	100	100	100	100	100	100	100	100	100	100
Coverage of irrigated land (in decimal)	n=550	n=526	n=1076	n=121	n=107	n=228	n=379	n=381	n=760	n=1050	n=1014	n=2064
Before	102.37	97.87	100.17	77.07	85.88	81.20	94.50	83.39	88.93	96.62	91.16	93.94
After	171.20	164.55	167.80	160.07	160.50	160.27	209.24	191.01	200.10	180.17	172.01	176.09

Table 10: Perception on irrigation water distribution practices (system): in %

Responses	Rajshahi N=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
By rotation: on the basis of equity	93	86	90	48	56	52	95	92	94	82	81	82
According to necessity: available when demanded	6	11	8	38	31	35	3	3	2	13	12	13
According to decisions of the distributor: presence of irrigated water unpredictable	1	3	2	14	13	13	2	5	4	5	7	5
Total	100	100	100	100	100	100	100	100	100	100	100	100

Table 11: Status of obtaining water from Deep Tube Well for irrigation including reasons for insufficiency and the alternate sources: in %

Status of DTW water	Rajshahi N=1600	Nawabganj n=1200	Naogaon n=2000	All districts n-4800
Sufficient	70	56	75	68
Partly sufficient	22	29	22	24
Not sufficient	8	15	3	8
Reasons of insufficient water				
Due to electricity failure	65	50	58	63
Due to low water level	16	5	5	11
Too many and or too large plots	6	15	13	9
Influential consume excess water	3	15	14	7
Management committee negligence	4	15	8	6
Use of kutcha channel	6	0	2	4
Alternate sources of water				
Demands never met	25	17	21	21
Meet from pond	11	51	22	32
Meet from rain water	2	28	13	16
Use low lift pump/Shallow TW	62	4	44	31

Table 12: Status of taking water problem from Buried Pipe/Pucca irrigation Channels: in %

Status	Rajshahi n=1600	Nawabganj n=1200	Naogaon n=2000	All sample districts n-4800
Yes	16	6	11	11
No	84	94	89	89
Total	100	100	100	100
Type of problems	n=260	n=76	n=217	n=553
Broken irrigation channel	51	8	16	32
Distance of land from irrigation channel	14	36	24	22
Obstructed flow of water through channels	9	15	32	19
Lack of sufficient water	20	15	17	17
Wastage of irrigation water	1	5	6	4
Absence of intra plots channel	3	12	3	4
Elevated Land	1	9	1	2
Influential control flow of water	1	0	1	0
Total	100	100	100	100

Table 13: Status of reduction wastage of irrigation water by high and low performing areas: in %

Status	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	95	88	91	96	92	94	92	87	89	94	89	92
No	5	12	9	4	8	6	8	13	11	6	11	8
Total	100	100	100	100	100	100	100	100	100	100	100	100
Mean percentage of reduction of wastage water	n=761	n=702	n=1463	n=554	n=579	n=1133	n=868	n=919	n=1787	n=2183	n=2200	n=4383
Pre project	45	45	45	24	23	24	37	37	37	36	36	36
Post project	10	12	11	9	12	11	14	15	15	11	13	12

H=High ; L=Low ; T= Total

Table 14: Status of reduction of cost per bigha of irrigated water by high and low performing areas: in %

Status	Rajshahi n=1600			Nawabganj n=1200			Naogaon n=2000			All sample districts n-4800		
	H	L	T	H	L	T	H	L	T	H	L	T
Yes	60	53	57	55	52	54	64	62	63	60	56	58
No	40	47	43	45	48	46	36	38	37	40	44	42
Total	100	100	100	100	100	100	100	100	100	100	100	100
Mean reduction of cost per bigha of irrigated water	n=479	n=374	n=853	n=135	n=107	n=242	n=364	n=303	n=667	n=978	n=784	n=1762
Pre project	1116.96	1057.36	1090.84	1110.26	1211.21	1154.90	1098.96	999.70	1053.87	1109.34	1055.08	1085.64
Post project	816.65	705.64	767.98	888.07	984.58	930.74	726.81	624.95	680.54	793.07	712.53	757.23

H=High ; L=Low ; T= Total

Table 15: Status of season wise supply and use of irrigated water

Season wise supply of irrigated water	Rajshahi n=1600		Nawabganj n=1200		Naogaon n=2000		All sample districts n-4800	
	Before	After	Before	After	Before	After	Before	After
Ravi (Kartik - Falgun or from 16th October to 15th March)								
Adequate	36	41	8	90	4	73	16	66
inadequate/not available	64	59	92	10	96	27	84	34
Total	100	100	100	100	100	100	100	100
Kharip-1 (Chaitra - Ashar or from 16th March to 15th July)								
Adequate	14	73	7	81	34	89	20	82
inadequate/not available	86	27	93	19	66	11	80	18
Total	100	100	100	100	100	100	100	100
Kharip-2 (Srabon - Ashin or from 16th July to 15th October)								
Adequate	26	54	8	80	24	72	21	68
inadequate/not available	74	46	92	20	76	28	79	32
Total	100	100	100	100	100	100	100	100
Season wise use of irrigated water								
Ravi (Kartik - Falgun or from 16th October to 15th March)								
Adequate	29	42	15	90	5	69	16	66
inadequate/not available	71	58	85	10	95	31	84	34
Total	100	100	100	100	100	100	100	100
Kharip-1 (Chaitra - Ashar or from 16th March to 15th July)								
Adequate	16	74	10	75	32	89	21	80
inadequate/not available	84	26	90	25	68	11	79	20
Total	100	100	100	100	100	100	100	100
Kharip-2 (Srabon - Ashin or from 16th July to 15th October)								
Adequate	23	46	10	69	16	63	16	59
inadequate/not available	77	54	90	31	84	37	84	41
Total	100	100	100	100	100	100	100	100

Table 16: Respondents opinion on further enhance the efficiencies of the Water Management Committees: in %

Measures	Rajshahi n=1155			Nawabganj n=556			Naogaon n=864			All sample districts n-2575		
	H	L	T	H	L	T	H	L	T	H	L	T
Activate WMCs to work with consensus & without influence/regular holding meeting (once in a month)	53	61	57	35	32	33	65	53	59	54	51	52
Raise awareness of WMC members through training	39	32	36	58	58	59	33	32	32	41	38	40
WMCs to undertake Supervision and monitoring	13	9	11	9	10	10	7	15	11	10	11	11
Motivate WMCs to prioritize Repair and maintenance	2	2	2	10	6	8	3	5	4	4	4	4

Multiple responses

Table 17: District wise status on increased food production by high and low performing areas and by pre and post project periods

District / Crop production per bigha (in maund)	High performing areas (n=2400)		Low performing areas (n=2400)		Total n-4800		% Difference in pre & post project
	Pre	Post	Pre	Post	Pre	Post	
Rajshahi							
Mean	11.0	19.7	10.6	19.1	10.8	19.4	8.6
Minimum	5	11	6	10	5	11	6
Maximum	20	30	22	29	22	30	8
Chapai Nawabganj							
Mean	11.0	17.8	11.1	17.6	11.0	17.7	6.7
Minimum	3	12	4	10	3	10	7
Maximum	18	25	20	25	20	25	5
Naogaon							
Mean	13.5	22.8	13.4	21.9	13.5	22.4	8.9
Minimum	6	10	5	10	5	10	5
Maximum	28	44	25	42	28	44	16
All 3 districts							
Mean	12.0	20.5	11.9	19.9	11.9	20.1	8.2
Minimum	3	10	4	10	3	10	7
Maximum	28	44	25	42	28	44	16

Table 18: Cropping intensities by districts and by pre and post project periods: in %

Name of districts	High performing areas (n=2400)			Low performing areas (n=2400)			Total n-4800			Cropping intensity (DAE 2009 report)
	Pre	Post	% changes	Pre	Post	% changes	Pre	Post	% changes	
Rajshahi	153	281	128	148	260	112	150	270	120	234
Nawabganj	123	244	121	117	233	116	120	239	119	221
Naogaon	128	248	120	122	243	121	125	246	121	207
All 3 districts	131	253	122	133	251	118	132	252	120	221

Table 19: Extent of changes in crops area & production between pre and post project periods

Name of crop	Area (ha)			Production (M.ton)		
	Pre	Post	% Change	Pre	Post	% Change
Boro	1080	2765	156	4775	15464	223.85
Aus	623	952	53	1661	3405	105
Aman	2264	2729	20.53	7875	11454	45.45
Wheat	138	209	51.45	349	632	81
Maize	13	18	38.46	23	38	65.21
Sugarcane	73	120	64.38	3905	7869	101.51
Mustard	102	132	29.41	103	188	82.52
Pulses	44	83	88.64	98	192	95.92
Vegetables	156	308	97.44	1684	4823	186.40
Fruits	63	83	20.00	1352	2359	74.48
Jute	23	11	-52.17	42	48	14.28

Appendix—2

Detailed Tables of Union Trainees

Table 1: Trainee's Characteristics

Variables	Rajshahi n=1600		Chapai Nawabganj n=1200		Naogaon n=2000		All sample districts n-4800	
Mean age(yrs)	40		37		42		40	
Minimum:	25		20		22		20	
Maximum:	67		60		70		70	
Mean education (class passed)	8		7		7		7	
Occupation (in %)	Pre	Post	Pre	Post	Pre	Post	Pre	Post
Agriculture	69	92	88	88	95	96	85	92
Service	3	8	0	8	3	4	2	7
Student	25	0	8	2	1	0	11	0
Business	3	0	4	2	0	1	2	1
Total	100	100	100	100	100	100	100	100

Table 2: Distribution of trainees by types of receiving training under Barind Command Area Development and Training Project: in %

Types of training received	Rajshahi n=61	Nawabganj n=48	Naogaon n=73	All sample districts n-182
Ideal Farmer	75	96	71	79
Tube well Operator/ Drain man/ Coupon Dealer	36	19	30	29
Fish Cultivator	5	13	12	10
Assistant Mechanic/ Agri-mechanic	3	2	6	4
Afforestation/ Nursery worker	2	0	10	4
Training of ideal farmers covered topics:	(n=46)	(n=46)	(n=52)	(n=144)
Crop diversification/ production of more crops	67	87	65	73
Proper use of fertilizer and pesticides	65	61	50	58
Collection of improved seeds and identify its quality	48	6	60	39
Proper use of water on land	9	13	8	10
Rearing of domestic animal	0	22	0	7
Prevention of weeds on land	4	0	6	4
Seedling plantation	4	0	6	4
Application of insecticides on the land	0	4	4	2
Prevention wastage of irrigation	2	0	2	1
Training of Tube well Operator/ Drain man/ Coupon Dealer covered topics:	(n=22)	(n=9)	(n=22)	(n=53)
Installation of deep tube wells	68	56	91	76
Ensuring proper supply of water from DTWs	55	33	73	59
Prevention of wastage of water from shallow tube well	14	0	51	26
Mechanical Functioning of deep tube wells	37	33	0	20
Enlistment and Distribution of coupon	5	0	0	2
On alternative energy use (diesel) in absence of electricity	0	0	5	2
Cleaning the channels	0	11	0	2
Training of Assistant Mechanic covered topics:	(n=2)	(n=1)	(n=3)	(n=6)
Repairing of deep tube well	100	100	100	100
Training of Nursery workers covered topics:	(n=1)	N=0	(n=7)	(n=8)
Planting trees on adjacent land	100	0	100	100
The impact of forest on environment	0	0	29	25
Training of Fisherman covered topics:	(n=3)	(n=6)	(n=9)	(n=18)
Fish cultivation	100	100	100	100
Giving food to the fish	67	17	56	44
Prevention of fish disease	0	17	22	17
Fish cultivation in the low land of deep tube well for mitigate the demand of food	33	0	11	11
Training of Agri mechanic covered topics:	(n=0)	(n=0)	(n=1)	(n=1)
Training on mechanical cultivation	-	-	100	100

Table 3: Trainees opinion on overall training: in %

Topics	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Overall Environment				
Very good	16	19	15	17
Good	71	50	77	68
Moderate	10	29	8	13
Bad	3	2	0	2
Total	100	100	100	100
Sitting Arrangement				
Very good	28	4	10	14
Good	59	56	80	67
Moderate	10	33	10	17
Bad	3	5	0	1
Worst	0	0	0	0
Not arranged	0	2	0	1
Total	100	100	100	100
Accommodation				
Very good	0	0	0	0
Good	8	4	64	30
Moderate	0	0	8	3
Bad	2	0	0	1
Not arranged	90	96	28	66
Total	100	100	100	100
Food				
Very good	5	0	1	2
Good	43	25	55	43
Moderate	38	63	30	41
Bad	10	4	13	10
Not arranged	4	8	1	4
Total	100	100	100	100
Transport				
Very good	2	0	0	1
Good	21	21	60	36
Moderate	5	15	21	14
Bad	15	2	12	11
Not arranged	57	62	7	38
Total	100	100	100	100
Training Materials				
Very good	5	4	0	3
Good	18	25	58	36
Moderate	24	65	29	37
Bad	24	6	13	15
Not arranged	29	0	0	9
Total	100	100	100	100
Equipment				
Very good	2	4	0	2
Good	7	19	21	15
Moderate	13	31	19	20
Bad	5	2	22	11
Not arranged	73	44	38	52
Total	100	100	100	100

Table 4: Trainees opinion on adequate duration of training: in %

Topics	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Yes	66	31	58	53
No	34	69	42	47
Total	100	100	100	100

Table 5: Trainees opinion on easily understanding the training subject: in %

Topics	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Yes	82	85	100	90
No	18	15	0	10
Total	100	100	100	100
Cause of not understanding	(n=11)	(n=7)	(n=0)	(n=18)
Short training period	55	43	-	50
Inadequacy of practical training	55	29	-	44
Difficult to understand language	0	86	-	33

Multiple responses

Table 6: Trainees opinion on measures for strengthening training program:: in %

Topics	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Repeat and refreshers' training	38	47	36	40
More practical training	37	47	35	39
Training on modernized cultivation	20	23	37	28
Increased duration of training	10	17	12	13
Train every farmer of the village	8	4	7	7
Provide training allowances	2	6	3	4
Equip the farmers with some tools	2	4	3	3
Furnish the farmers with printed materials on improved farming	2	4	3	3

Multiple responses

Table 7: Distribution of trainees by status of needs training and topics of training in future to enhance their skill: in %

Topics	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Yes	97	83	93	92
No	3	17	7	8
Total	100	100	100	100
Topics needs for future training	(n=59)	(n=40)	(n=68)	(n=167)
Modern cultivation methods	73	38	63	61
Improved seeds	0	5	19	9
Use of fertilizer and pesticides	3	10	5	5
Vegetable cultivation	0	13	0	3
Prevention of plant diseases	3	0	2	2
Wheat cultivation	3	3	0	2
Improving intensity of cultivation on small plots of land	2	0	4	2
Repair and maintenance of deep tube well	29	33	81	50
Fish cultivation	22	20	9	16
Rearing of domestic animals	3	28	0	8
Afforestation including fruit bearing trees	7	0	2	3
Cow fattening	1	1	2	2

Multiple responses

Table 8: Trainee's opinion on types of assistance they received from BMDA: in %

Types of assistance	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Provide mechanical support through technician	23	33	48	36
Received minimum financial support	5	17	16	13
Provide support in case of greater problem	13	13	16	14
Repair equipment, if damaged	12	27	45	29
Provide all sorts of assistance	7	6	12	9

Multiple responses

Table 9: Trainee's opinion on types of assistance they received from BMDA: in %

Types of assistance	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Received mechanical support through technicians	23	33	48	36
Repair equipment support, if damaged	12	27	45	29
Received support in case of major problems	13	13	16	14
Minimum financial support	5	17	16	13
Other assistance, if necessary	7	6	12	9
Assistance not received	44	21	8	24

Multiple responses

Table 10: Status of follow-up checks on Deep Tube Wells/irrigation channels by BMDA: In %

Status	Rajshahi (n=61)	Chapai Nawabganj (n=48)	Naogaon (n=73)	Total (n=182)
Yes	56	92	96	81
No	44	8	4	19
Total	100	100	100	100

Appendix —3: Pictures of Local Level Workshop at Puthia & Observed Barind Irrigation System

Pictures of Local Level Workshop at Puthia






Pictures of Observed Barind Irrigation System






Appendix—4

Development of Command Area

Sl. No.	Name of Upazilla	No. of Union	No. of Village	Number of Channel		Command Area before Channel Construction (ha.)	Command Area after Channel Construction (ha.)	International Command Area (ha.)	Remarks
				Constructed	Used	Avg.	Avg.	Avg.	
1	2	3	4	5	6	7	8	9	10
Rajshahi District									
1.	Godagari	18	410	60	60	17.96	79.44	61.48	
2.	Tanore	15	187	55	55	18.94	40.69	21.75	
3.	Paba	9	268	57	57	14.54	41.29	26.75	
4.	Mohanpur	6	159	50	50	25.46	37.62	12.15	
5.	Bagmara	33	324	59	59	22.98	30.09	7.10	
6.	Durgapur	7	123	47	47	15.21	30.21	15.00	
7.	Puthia	6	184	45	45	16.80	21.98	5.17	
8.	Bagha	15	91	20	20	2.47	5.80	3.33	
9.	Charghat	15	114	22	22	1.01	2.76	1.75	
	Total	124	1860	415	415	17.17	37.91	20.74	
Chapai Nawabganj District									
10.	Chapai Nawabganj	29	220	39	39	21.31	45.86	24.54	
11.	Shibgonj	24	401	57	57	14.75	28.72	13.96	
12.	Gomostapur	17	231	55	55	13.87	37.69	23.81	
13.	Nachol	4	201	41	41	20.10	65.64	45.53	
14.	Bholahat	4	95	44	44	23.80	34.47	10.66	
	Total	78	1148	236	236	18.30	41.21	22.91	
Naogaon District									
15.	Mohadevpur	10	302	67	67	20.49	33.73	13.23	
16.	Patnitala	20	293	48	48	24.39	30.15	5.75	
17.	Dhamuirhat	8	263	42	42	20.26	27.03	6.76	
18.	Badalgachi	8	235	47	47	13.01	21.85	8.83	
19.	Sapahar	6	234	38	38	23.10	28.88	5.77	
20.	Porsha	6	253	40	40	13.82	24.72	10.90	
21.	Manda	14	292	54	54	18.40	30.31	11.90	
22.	Niamatpur	8	342	59	59	28.51	51.46	22.95	
23.	Naogaon	21	216	49	49	23.13	28.40	5.27	
24.	Raninagar	8	173	48	48	15.30	31.09	15.78	
25.	Atrai	8	201	17	17	10.41	29.58	19.17	
	Total	117	2804	509	509	19.94	31.95	12.01	
Three Districts Total		319	5812	1160	1160	18.54	36.18	17.63	

Appendix—5

Set of Survey Tools (Questionnaire in Bangla)

diɑ-1

e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí

Lvbv Rwic ckgvjv

‡Km bst

fwgKv: Avmmvjvg AvjvBKg| Avgiv ixW bvgK M‡elYv cwZôvb Ges cwiKíbv gš¿Yvj‡qi AvBGgBwW (IMED) Gi c¶ †_‡K gvV chv‡q gj¨vqb Rix‡ci D‡Ï‡k¨ G‡mwQ| Avcbviv Rv‡bb e‡i›` eûgLx Dbqb KZc¶ (BMDA)-KZK 1996-2006 mv‡j ewsjv‡`‡ki 3wU †Rjvi 25wU Dc‡Rjvq e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí bv‡g GKwU cK‡íi KvR ev¯—ewqZ n‡q‡Q, hvi D‡Ïk¨ wQj AÎ Mfxi bjKc GjvKvq f-Mf¯— cvBc bvjv /cvKv †mPbvjv wbgvY K‡i cwbi AcPq †iv‡ai gva¨‡g †mP GjvKv ew×i cvkvcwk GjvKvq `wi` I wcwQ‡q _vKv Rb‡Mwô‡K AvaywbK Pvlev‡`i Kjv †KŠkj I DbZ Rxeb e¨e¯—vi mv‡_ AewnZ K‡i Zv‡`i Av_-mvgwRK Ae¯—vi Dbqb Kiv| eZgvb Rix‡ci D‡Ïk¨ n‡"Q f-Mf¯— cvBc bvjv/cvKv †mPbvjv wbgv‡bi Ae¯—v, †m‡Pi cwb mieiv‡ni AMMwZ, e¨envi, cwbi AcPq †iva, AvaywbK chw³ c‡qv‡Mi gva¨‡g dmj Drcv`b I Gi gva¨‡g Av_-mvgwRK Ae¯—vi Dbqb KZUK n‡q‡Q Zv gj¨vqb Kiv|

G cm‡½ Avcwb Avcbvi gj¨evb Z_¨ c`v‡bi gva¨‡g G M‡elYvq Ae`vb ivL‡Z cv‡ib| Avcbvi gZvgZ ïagvÎ M‡elYvi Kv‡R e¨eüZ n‡e Ges Avcbvi †`qv Z_¨ m¤úY ‡Mvcb ivLv n‡e| Avcbvi AbgwZ †c‡j Awg mv¶vrKvi ï‘i Ki‡Z cwi|

wefvM :	†KvWbs : .....
‡Rjv :	†KvWbs : .....
Dc‡Rjv :	†KvWbs : .....
BDwbqb :.....	†KvW bs : .....
‡gš¿Rv/IqvW bs :	‡KvW bs : .....
Mvg :	‡KvW bs : .....
Mfxi bjK‡ci ID bs: .....:†jv‡Kkb:.....	

DËi`vZv/DËi`vÎxi aib:

A. Coverage of Agricultural land Above Aveage (50%)	1. Adult Male Preferably Head of Household (Farmer) 2. Married Women (Preferably wife of the Male Respondent)
B. Coverage of Agr icultural land Below Aveage (50%)	1. Adult Male Preferably Head of Household (Famer) 2. Married Women (Preferably wife of the Male Respondent)

mv¶vrKvi MnYKvixi bvg :	mv¶vrKvi Mn‡Yi ZwiL: .....
mcvifvBRv‡ii bvg :	ZwiL: .....
mv¶vrKvi MnY: ï‘i mgq :	‡kl mgq: .....

B›Uvi wfDqvi‡`i Rb¨ wb‡`kbv t B›Uvi wfDqvi mv¶vrKvi ï‘i Av‡M †_‡KB DËi`vZv‡K ckgvjvq D‡jwLZ Ôc‡e Ges eZgv‡b Õ mg‡qi e¨vL¨v w`‡q wb‡eb| Ôc‡e Õ Ges ÔeZgv‡bi Õ e¨vL¨v n‡jv t 1. Ôc‡e Õ A_vr wbw`ó GjvKvq e‡i›` cKí ev¯—evq‡bi KvR †kl nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges 2. ÔeZgvbÕ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 ‡_‡K 12 gv‡mi GKUv Mo mgq| mg‡qi GB wn‡m‡e Ôc‡e Ges eZgvbÕ mg‡qi Z_¨ Avb‡Z n‡e|

‡mKkb-1: Lvbv‡i mvav‡iY Z_¨vejx

1. DËi `vZv‡i bvg: .....

2. eqm: ..... eQi

3. DËi `vZv/`vÎx‡i wk¶vMZ †hvM¨Zv: ..... (m‡ev"P ‡h †kYx cvm K‡i‡Qb)

4. ^eewnK Ae¯v: 1. weewnZ 2. Awweewn Z 3. wecZxK 4. Zvjv‡Kcvß 5. c_K

5. cwiev‡ii †gvU m`m¨ msL¨vt .....Rb (0-14 eQi chš wkï; 14 eQ‡ii D‡× eq¯‹ m`m¨)

eq®‹ ci"lt.....Rb	†Q‡j wkït .....Rb
eq®‹ gwnjvt.....Rb	†g‡q wkït.....Rb

6. Avcbvi RxweZ mšÍvb msL¨v KZ? †Q‡j: ..... †g‡q: ..... ‡gvU: .....

7. cwiev‡ii aib: 1. GKK cwievi 2. †hŠ_ cwievi

8. cwiev‡ii †gvU DcvRbKvix m`m¨ msL¨v: ..... Rb

‡mKkb-2: e‡i›` †mP GjvKv m¤úwKZ Z_¨

9. Avcbv‡`i Mv‡g 1996-2006 mv‡j e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi gva¨‡g wK wK KvR n‡q‡Q?

   1. Mfxi bjKc.....wU 2. f -Mf¯ cvBc ‡mPbvjv: .....wU
   3. cvKv †mPbvjv: .....wU 4. cwk¶Y Kvhµg 5. Ab¨vb¨ (wbw`ó Ki"b) .....

K. Avcbv‡`i Mv‡g e‡i›` ‡mP cK‡íi ‡h KqwU Mfxi bjKc Av‡Q Zvi g‡a¨t

   1. KZwU Kvh¶gt.....wU 2. KZwU Kvh¶g ‡bBt.....wU

L. †h¸‡jv Kvh¶g ‡bB, Zvi KviY wK wK? .....

.....

10. Avcwb e‡i›` †mP cK‡íi Mfxi bjK‡ci f-Mf¯ cvBc/cvKv †mPbvjvi cwb ‡m‡Pi Kv‡R e¨envi K‡ib wK?
    1. n¨v 2. bv

K. n¨v n‡j, Avcwb †Kvb Mfxi bjKc †_‡K †m‡Pi Rb¨ cwb †bb (Mfxi bjK‡ci ID bs mn †jv‡Kkb we¯wiZfv‡e D‡jL Ki"b) ?.....

.....

L. GB Mfxi bjK‡ci Avl Zvq †gvU KZ wgUvit

   1. f-Mf¯ cvB‡ci ‡mPbvjv Av‡Qt.....wgUvi 2. cvKv ‡mPbvjv Av‡Qt .....wgUvi 3. Rwbbv

M. Avcwb D‡jwLZ Mfxi bjK‡ci †Kvb ai‡bi †mPbvjv †_‡K †mP Kv‡Ri Rb¨ cwb e¨envi K‡ib?

   1. f-Mf¯ cvB‡ci ‡mPbvjv †_‡K 2. cvKv ‡mPbvjv ‡_‡K
   3. Dfq ‡mPbvjv ‡_‡K (f-Mf¯ cvBc I cvKv) 4. Ab¨vb¨ (wbw`ó Ki"b) .....

N. Avcwb †Kvb eQi †_‡K GB Mfxi bjK‡ci cvBc/cvKv †mPbvjvi cwb ‡m‡Pi Kv‡R e¨envi ï‘i K‡i‡Qb?

1. f-Mf¯ cvB‡ci ‡mPbvjvt .....mv‡j 2. cvKv †mPbvjvt .....mv‡j

O. Avcwb wK wK Kv‡R GB f-Mf¯ cvBc/cvKv †mPbvjvi cwb e¨envi Ki‡Qb?

wK wK Kv‡R †m‡Pi cwb e¨envi Ki‡Qb?	RvZ: †KvW: 1. nvBexW 2. D”Pdjbkxj 3. ¯vbxq RvZ	wK ai‡bi †mPbvjv †_‡K cwb †bb? ‡KvWt 1. f-Mf¯ ‡mPbvjv †_‡K 2. cvKv ‡mPbvjv ‡_‡K 3. Dfq †_‡K 4. c‡qvRb nq bvB	‡mPbvjv / ‡m‡Pi cwb mieiv‡ni Drm †_‡K Avcbvi Rwg KZ`‡i Aew¯Z? ‡KvWt 1. Le Kv‡Q 2. Aí `‡i 3. gvSvgvwS 4. †ekx `‡i/†kl cv‡š
1. †ev‡iv avb Avev‡`			
2. AvDm avb Avev‡`			
3. Avgb avb Avev‡`			
4. Mg Pv‡l			
5. meRx Pv‡l (bvg: .....)			
6. d‡ji evMv‡b (bvg: .....)			
7. Ab¨vb¨ (wbw`ó Ki“b):			

P. wK wbq‡g cK‡íi ‡m‡Pi cwb weZiY Kiv nq?

1. chvqµ‡g 2. c‡qvRb‡f‡` 3. `wqZcvß eÈbKvixi g‡Z 4. Ab¨vb¨ (wbw`ó Ki“b) .....

11. GB Mfxi bjKc †_‡K wK cwigv‡Y †m‡Pi cwb cvlqv hvq? 1. chvß 2. AvswkK chvß 3. chvß bq

K. chvß bv n‡j, Zvi KviY wK wK? .....

.....

L. hw` chvß cwigv‡Y †m‡Pi cwb bv cvb Zvn‡j wKfv‡e †m‡Pi cwbi Pwn`v ciY K‡ib? .....

.....

12. f-Mf¯ cvBc/cvK †mPbvjv †_‡K †m‡Pi cwb †bqv‡Z Avcbvi †Kvb Amweav nq wK? 1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi Amweav nq? .....

L. ‡m‡Pi Dr†mi †ekx `‡i/†kl cv‡ši Rwg‡Z cwb †c‡Z Amweav nq wK? 1. n¨v 2. bv

M. n¨v n‡j, wK wK Amweav nq?

1. chvß cwbi Afve 2. Drcv`b LiP ew× 3. ‡m‡Pi bvjv fv½v	4. ‡m‡Pi bvjvi †P‡q Rwg DP 5. Ab¨vb¨ (wbw`ó Ki“b) .....

13. †mP Kv‡Ri Rb¨ f-Mf¯ cvBc/cvKv ‡mPbvjv †_‡K wKfv‡e Avcbvi Rwg‡Z cwb †bb?

1. Rwg †_‡K Rwg (fwm‡q)	3. f-Mf¯ cvB‡ci bvjvi gva¨‡g
2. gvV bvjvi gva¨‡g	4. Ab¨vb¨ (wbw`ó Ki“b) .....

14. dm‡j i gv‡V e‡i›` cK‡íi ‡m‡Pi cwib mieiv‡n wK ai‡bi Amwnavq?

1. cwibe›Ub h_vmg‡q nqbv	5. cwib eÈb e¨e¯v µwUcY
2. cfvekvjx e¨w³ iv †ekx cwib ‡bq	6. ‡mP bvjv mwVKfv‡e Kiv nq bvB
3. e¨e¯vcbv KwgwU †ekx cwib †bq	7. cwib e¨e¯vcbv KwgwU bvB
4. cwib mieiv‡ni †gwkb/‡mP bvjv/wb®vkb bvjv bó n‡j mwVK mg‡q †givgZ Kiv nq bv	8. ‡Kvb Amwnavq nqbv
	9. Ab¨vb¨ (wbw`ó Ki“b) .....

15. Mfxi bjK‡c f-Mf¯ cvBc/cvKv †mPbvjv Kivi d‡j c‡ei Zjbvq eZgv‡b †m‡Pi Rwg e¨w× †c‡q‡Q wK?
1. n¨v 2. bv

K. n¨v n‡j, wK cwigvb †m‡Pi AvIZvq Rwg e¨w× †c‡q‡Q?

(ÔÔc‡e Ó ej‡Z wbw`ó GjvKvq e‡i›` cKí ev¯evq‡bi KvR †kl nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges ÔÔeZgv‡bÓ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 gvm †_‡K 12 gv‡mi GKUv Mo mgq)

c‡e t .....kZvsk Rwg wQj	eZgv‡b t .....kZvsk Rwg n‡q‡Q

16. f-Mf¯ cvBc/cvKv †mPbvjv Kivi d‡j Avcbv‡`i Mv‡g c‡ei Zjbvq eZgv‡b †m‡Pi cwibi AcPq K‡g‡Q wK?
1. n¨v 2. bv

K. n¨v n‡j, cwibi AcPq KZfvM K‡g‡Q?

c‡e t .....% n‡Zv	eZgv‡b t .....% nq

L. bv n‡j, cwibi AcPq bv Kgvi KviY wK?.....

.....

17. f-Mf¯ cvBc/cvKv †mPbvjv Kivi d‡j c‡ei Zjbvq eZgv‡b weNv cwZ †mP LiP K‡g‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, KZfvM K‡g‡Q?

c‡e t .....UvKv wQj (cwZ weNvq)	eZgv‡b t .....UvKv n‡q‡Q (cwZ weNvq)

18. Avcbvi Mv‡g †gŠmg †f‡` ‡m‡Pi cwib mieiv‡ni Ae¯v I †m‡Pi cwib e¨envi‡ii nvi †Kgb _v‡K?

‡gŠmg	K. cwib mieiv‡ni Ae¯v †Kgb? †KvW: 1.chvß 2. Achvß 3.cvIqv ‡hZ bv/hvqbv		L. †Kvb ‡gŠm‡g ‡Kgb †m‡Pi cwib e¨envi K‡ib? †KvW: 1. chvß 2. Achvß 3.cvIqv ‡hZ bv/hvqbv 4. e¨envi Kwibv	
	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)
1. iwe (KwZK - dvêb ev A‡±vei-gvP)				
2. Lwic-1 (ˆPÎ - Avlvp ev gvP-Rb)				
3. Lwic-2 (kveb - Awkb ev RjvB-A‡±vei)				
4. mviv eQi				

19. ‡m‡Pi PvR wKfv‡e w`‡Z nq?
1. bM` UvKv 2. wc‡cBW Kv‡Wi gva¨‡g 3. dm‡j i A‡aK
4. dm‡j i wZb fv‡Mi GK fvM 5. dm‡j i Pvifv‡Mi GK fvM 6. Ab¨vb¨ (wbw`ó Ki“b).....

20. bM` UvKv ev wc‡cBW Kv‡Wi gva¨‡g w`‡Z n‡j, GK weNvq KZ UvKv w`‡Z nq? .....UvKv

21. e‡i›` cKí ïi“i mg‡q ev¯evq‡bi wel‡q Avcwb Rvb‡Zb wK? 1. n¨v 2. bv

22. e‡i›` cKí ïi“i mgq †Kvb eo ai‡bi mgm¨v n‡qwQj wK? 1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi mgm¨v n‡qwQj? .....

.....

23. GB cKí ev¯evq‡bi ‡Kvb Kv‡Ri mv‡_ Avcwb RwoZ wQ‡jb?

1. wbgvY Kv‡R
2. gwU Lb‡bi Kv‡R
3. kg `vb/kwgK `vb
4. Rwg `vb
5. ev¯evqb Kwgw U‡Z
6. e¨e¯vcbv I i¶Yv‡e¶Y Kv‡R
7. ‡Kvb Kv‡R RwoZ wQjvg bv
8. Ab¨vb¨ (wbw`ó Ki“b) .....

K. cK‡íi Kv‡R AskMnY K‡i Avcwb wK †Kvb fvZv ev gRix †c‡q‡Qb? 1. n¨v: .....UvKv (‰`wbK) 2. bv

24. D³ cKí¸‡jv‡Z gwnjvi AskMnY K‡i‡Qb wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, D³ cK‡í ci“I I gwnjv‡`i mgvb gRix †`qv nZ wK? 1. n¨v 2. bv

L. bv n‡j, †Kb?

1. gwnjv‡`i Ae‡njv Kiv nq
2. kwiixK A¶gZv
3. Kv‡Ri AwfÁZv Kg
4. gwnjv‡`i Kv‡R Ask Mnb Kg/gwnjvi Kg KvR K‡i
5. Ab¨vb¨ (wbw`ó Ki“b) .....

25. ‡mPbvjv wbgv‡Yi mgq ¯vbxq †Kvb KwgwU MVb Kiv n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

26. Avcbvi g‡Z, cvBc/cvKv †mPbvjvi wbgvY KvR wVKgZ n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

27. e‡i›` cK‡íi GB Mfxi bjK‡ci f-Mf¯ cvBc/cvKv †mPbvjv Qvov Ab¨ †Kvb Drm †_‡K Avcwb dmj Drcv`‡b †m‡Pi cwb e¨envi K‡ib wK? 1. n¨v 2. bv

K. n¨v n‡j, †Kvb dm‡ji Rb¨ ev wK Kv‡R Ges †Kvb Drm †_‡K Avcwb GB †m‡Pi cwb e¨envi K‡ib?

dm‡ji bvg (cwZwU dm‡ji bvg a‡i a‡i wR‡Ám Ki“b e‡i›` cK‡íi Mfxi bjK‡ci cvBc/cvKv †mPbvjv Qvov, †Kvb dm‡j wK‡mi gva¨‡g †m‡Pi cwb mieivn K‡i)	RvZ: †KvW: 1. nvBexW 2. D”Pdjbkxj 3. ¯vbxq RvZ	‡m‡Pi cwb mieiv‡ni Drm/gva¨g (bx‡Pi Ni¸‡jv‡Z †KvW emvb) ‡KvW: 1. Mfxi bjKc 2. AMfxi bjKc 3. ‡jv wjdU cv¤ú 4. Ab¨vb¨ (wbw`ó Ki“b) .....
1. †ev‡iv avb Avev‡`		
2. AvDm avb Avev‡`		
3. Avgb avb Avev‡`		
4. Mg Pv‡l		
5. meRx Pv‡l (bvg: .....)		
6. d‡ji evMv‡b (bvg: .....)		
7. Ab¨vb¨ (wbw`ó Ki“b):		

L. †Kb Avcwb e‡i›` cK‡íi Drm Qvov, Ab¨vb¨ Drm †_‡K †m‡Pi cwb e¨envi K‡ib? .....

.....

M. Ab¨vb¨ Drm †_‡K Avcbvi Pwn`vi KZfvM cwb e¨envi K‡ib? .....%

‡mKkb- 3: cKí i¶Yv‡e¶Y m¤úwKZ Z_¨

28. Avcwb e‡i›` cK‡íi †h Mfxi bjK‡ci AvIZvq †h †mPbvjvi cwb e¨envi Ki‡Qb Zvi Ae¯v eZgv‡b †Kgb i‡q‡Q?

1. Mfxi bjKc	1. Le fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)	2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)
2. f-Mf¯ cvBc †mPbvjv	1. Le fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)	2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)
3. cvKv †mPbvjv	1. Le fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)	2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨vw` bvB) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨vw` Av‡Q)

29. GB Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjvi i¶Yv‡e¶‡bi KvR †K ev Kviv K‡i _v‡Kb?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. Ab¨vb¨ (wbw`ó Ki“b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. Ab¨vb¨ (wbw`ó Ki“b) .....

K. GB Mfxi bjKcwU weKj n‡j Kviv †givgZ K‡i?

1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. Ab¨vb¨ (wbw`ó Ki“b) .....

L. †givgZ I i¶Yv‡e¶‡bi LiP †K enb K‡i?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. Ab¨vb¨ (wbw`ó Ki“b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. Ab¨vb¨ (wbw`ó Ki“b) .....

M. Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjv ‡Kvb mg‡q i¶Yv‡e¶Y Kiv n‡q _v‡K?

1. Mfxi bjKc	1. dmj †gŠmg ïi“i c‡e 4. c‡qvRb gZ BMDA †K Rvbv‡j	2. cwb e¨env‡ii mg‡q 5. wKQB Kiv nq bv	3. dmj DVvi c‡i 6. Ab¨vb¨ (wbw`ó Ki“b) .....
3. f-Mf¯ cvBc/ cvKv †mPbvjv	1. dmj †gŠmg ïi“i c‡e 4. c‡qvRb gZ BMDA †K Rvbv‡j	2. cwb e¨env‡ii mg‡q 5. wKQB Kiv nq bv	3. dmj DVvi c‡i 6. Ab¨vb¨ (wbw`ó Ki“b) .....

N. ‡mP hš wKfv‡e Pwjz nq?

1. we`¨r Øviv 2. wW‡Rj Øviv 3. Ab¨vb¨ (wbw`ó Ki“b) .....

‡mKkb- 4: cK‡íi cwb mieivn I e¨e¯vcbv KwgwU/`j msµvš

30. Avcbvi Mv‡g cwb e›U‡bi `wqZ †K ev Kviv cvjb K‡ib?

1. e‡i›` eûgLx Dbqb KZc¶ (BMDA)
2. cwb e¨e¯vcbv KwgwU (w¯‹g KwgwU)
3. GjvKvi KlKMY
4. ¯vbxq †bZe›`
5. ‡Wbg¨vb
6. Ab¨vb¨ (wbw`ó Ki“b) .....

31. Avcbv‡`i Mv‡g cwb mieivn, e¨envi I e¨e¯vcbv mwgwZ/`j MVb Kiv n‡q‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. hw` cwb e¨e¯vcbv KwgwU/ `‡ji K_v D‡jL K‡i Z‡e wR‡Äm Ki“b, cwb e¨e¯vcbv KwgwU/`j wK wK KvR K‡i _v‡Kb?

1. Mv‡g cwb e›Ub I mieivn
2. cwbi h_vh_ e¨envi wel‡q civgk
3. civgk w`‡q mvnvh¨ Kiv
4. cwk¶Y c`vb
5. Mfxi bjKc I ‡mPbvjv i¶Yv‡e¶Y I †givgZ
6. Ab¨vb¨ (wbw`ó Ki“b) .....

L. Avcwb eZgvb cwb e¨e¯vcbv /†mP KwgwU/`‡ji Kv‡R wK iKg mšó?

1. Le mšó 2. mšó 3. †gvUvgwU mšó 4. mšó bq

M. cwb e¨e¯vcbv/†mP KwgwU/`‡ji Kvhµg Avi I ew×i Rb¨ wK Kiv c‡qvRb? .....

.....

.....

‡mKkb- 5: cwk¶Y msµvš

32. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq Avcwb †Kvb cwk¶Y †c‡q‡Qb wK? 1. n¨v 2. bv

K. n¨v n‡j, D³ cK‡íi AvIZvq Avcwb †Kvb ai‡bi cwk¶Y †c‡q‡Qb?

cwk¶‡Yi aiY	KZw`‡bi cwk¶Y †c‡q‡Qb?
1. Av`k KlK	
2. bjKc Acv‡iUi/‡Wbg¨vb/Kcb wWjvi	
3. ‡gKwbK mnKvix	
4. ebvqb/bvmvix Kgx	
5. grm¨Pvlx	
6. Kwl hvšxKviK	
7. Ab¨vb¨ (wbw`ó Ki“b)	

L. cwk¶Y †_‡K †h me Ávb I `¶Zv ARb K‡i‡Qb Zv Avcbvi Kv‡R wKfv‡e mnvqZv n‡q‡Q/wKfv‡e Kv‡R jvMv‡Z †c‡i‡Qb?

.....

.....

M. cwk¶‡Yi gvb †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

‡mKkb- 6: e‡i›` cK‡íi Kvhµg Pvj nIqvi c‡ei I eZgvb Av_ -mvgwRK Ae¯v

33. e‡i›` cK‡íi †mP Kvhµg Pvj nIqvi c‡e Ges eZgv‡b Avcbvi cavb †ckv (1wU DËi mv‡Kj Ki“b)

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 -12 gv‡mi GKUv Mo mgq)
1. Kwl KvR 2. Kwl gRi 3. Kj-KviLvbvi kwgK 4. ¶` e¨emv 5. gvSvix e¨emv 6. eo e¨emv 7. PvKix 8. ‡eKvi 9. Ab¨vb¨ (wbw`ó Ki“b)	1. Kwl KvR 2. Kwl gRi 3. Kj-KviLvbvi kwgK 4. ¶` e¨emv 5. gvSvix e¨emv 6. eo e¨emv 7. PvKix 8. ‡eKvi 9. Ab¨vb¨ (wbw`ó Ki“b) .....

34. e‡i›` cK‡íi †mP Kvhµg Pvj nIqvi c‡e Ges eZgv‡b Avcbvi cwiev‡i wK wK Lv‡Z gwmK e¨q nq?

e¨‡qi LvZ	c‡e t Mo gwmK e¨q (UvKvq) (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b t Mo gwmK e¨q (UvKvq) (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)
1. Lv`¨		
2. dmj Pvlvev`		
3. wPwKrmv		
4. ‡cvlvK		
5. ¯‹j-K‡jR		
6. cwienb		
7. wej (we`¨r/M¨vm/†K‡ivwmb)		
8. Drme		
9. Ab¨vb¨ (wbw`ó Ki“b)		
‡gvU gwmK e¨q (UvKv)		

35. e‡i›` cK‡íi †mP Kvhµg Pvj nIqvi c‡e I eZgv‡b Avcbvi cwiev‡ii gwmK Av‡qi Drm I cwigvY:

Av‡qi Drm	c‡e t Mo gwmK Avq (UvKvq) (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b t Mo gwmK Avq (UvKvq) (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)
1. KwlLvZ †_‡K		
2. cï cvjb †_‡K (Mi“/QvMj/nvmgiMx)		
3. Ab¨vb¨ Drm †_‡K (e¨emv/PvKix BZ¨v`x)		
4. Ab¨ ¯¿vb †_‡K †cwiZ (†iwg‡UÝ)		
5. eÜKx m¤ú` †_‡K		
6. FY †`Iqv †_‡K		
7. Ab¨vb¨ (wbw`ó Ki“b)		
†gvU gwmK Avq (UvKv)		

36. e‡i›` cK‡íi †mP Kvhµg Pvj nIqvi c‡e I eZgv‡b Avcbvi Rwgi cwigvY t

Rwg ev fwgi aiY	c‡e: (kZvs‡k) (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (kZvs‡k) (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)
1. emZ wfUv		
2. wbR¯ Pvl‡hvM¨ Rwg		
K. †mPKZ Pvl‡hvM¨ Rwg		
L. †mP Qvov Pvl‡hvM¨ Rwg		
3. eMv Rwg (†`qv/†bqv)		
4. cwZZ Rwg		
5. cKi		
6. evMvb evox		
7. Ab¨vb¨ Rwg (wbw`ó Ki“b)		
†gvU Rwgi cwigvY		

37. e‡i›` cK‡íi †mP Kvhµg Pvj nIqvi c‡e Ges c‡i wK ai‡bi Lv`¨ MnY K‡i _v‡Kb?

Lv‡`¨i bvg	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)		eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 †_‡K 12 gv‡mi GKUv Mo mgq)	
	w`‡b KZevi	mvZ w`‡b KZevi	w`‡b KZevi	mvZ w`‡b KZevi
1. fvZ				
2. i“wU				
3. Wvj				
4. gvQ				
5. gvsm				
6. wWg				
7. `a/`aRvZ `e¨				
8. kvK-mewR				
9. dj				
10. Ab¨vb¨ (wbw`ó Ki“b)				

38. e‡i›` †mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b †Q‡j‡g‡q‡`i ¯‹j/K‡jR/gv`vmvq wk¶vi m‡hvM †e‡o‡Q wK?
1. n¨v 2. bv

K. Avcbvi cwiev‡i wk¶v cwZôv‡b hvIqvi Dc‡hvMx mšÍb KZRb Ges KZRb †h‡Z cviZ Ges cv‡i?

c‡e	K. wk¶v cwZôv‡b hvIqvi Dc‡hvMx m`‡m¨i msL¨v:.....Rb L. Gi g‡a¨ †Q‡j KZRb †hZ:.....Rb M. Gi g‡a¨ †g‡q KZRb †hZ:.....Rb
eZgv‡b	K. wk¶v cwZôv‡b hvIqvi Dc‡hvMx m`‡m¨i msL¨v:.....Rb L. Gi g‡a¨ †Q‡j KZRb hvq:.....Rb M. Gi g‡a¨ †g‡q KZRb hvq:.....Rb

39. Avcbvi cwievwiK evmMn, cwbi Drm, cqtwb®wkb, Av‡jvi e¨envi I gj¨evb `e¨w³ BZ¨vw` m¤úwKZ Z_¨:

welq	c‡e	eZgv‡b
K. evmM‡ni aiY: (DË‡ii N‡i bx‡Pi †KvW emvb) 1. cvKv evox 2. †mwg cvKv (B‡Ui †`qvj I wU‡bi Qv`) 3. KvPv †eov I wU‡bi Qv` 4. m¤úY wUb 5. KvPv †eov I L‡oi Qv` 6. wU‡bi ‡eov I N‡oi Qv` 7. wU‡bi Pvj I gwUi †`qvj 8. Ab¨vb¨ (wbw`ó Ki“b)		
L. †gvU K‡¶i msL¨v	.....wU	.....wU
M. Lvevi cwbi Drm: (DË‡ii N‡i bx‡Pi †KvW emvb) 1. wbR¯ wUDe‡qj 2. A‡b¨i wUDe‡qj 3. Kqv 4. mvcvB/U¨v‡ci cwb 5. Ab¨vb¨ (wbw`ó Ki“b)		
N. cvqLvbv (DË‡ii N‡i bx‡Pi †KvW emvb) 1. KvPv/Sjš 2. wcU j¨wUb/cvKv 3. ¯v¯¨m¤§Z cvqLvbv (m¨wbUwi) 4. †Lvjv RvqMvq		
O. Av‡jvi e¨envi: (DË‡ii N‡i bx‡Pi †KvW emvb) 1. †K‡iwmb 2. we`¨r 3. Ab¨vb¨ (wbw`ó Ki“b)		
P. gj¨evb ‰ZRmcÎ wK wK Av‡Q: (DË‡ii N‡i bx‡Pi †KvW emvb) 1. wUwf 2. †iwWI 3. dxR 4. †Uwj‡dvb (‡gvevBj) 5. gUi mvB‡Kj 6. evB-mvB‡Kj 7. †mjvB †gwkb 8. LvU/†PŠwK 9. †Pqvi/†Uwej 10. Ab¨vb¨ (wbw`ó Ki“b)		

40. Lvbvi Av_-mvgwRK Ae¯v : (33-39 bs c‡ki Av‡jv‡K wbaviY Ki“b)

1. nZ`wi` (gwmK Avq - 2000 UvKv ev Zvi bx‡P)
2. `wi`/wbgwË (gwmK Avq - 2001 UvKv †_‡K 7500 UvKv)
3. ¯”Qj/ga¨weË (gwmK Avq - 7501 UvKv ev Zvi D‡×)

‡mKkb- 7: ‡hvMv‡hvM msµvš Z_¨

41. e‡i›` cKí ev¯evq‡bi c‡e Ges eZgv‡b †hvMv‡hvM e¨e¯vi weeiY

welq	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
	1. wQj 2. wQjbv	1. Av‡Q 2. bvB
1. KvPv iv¯v		
2. cvKv iv¯v		
3. evm mwfm		
4. UvK		
5. †ij †ivW		
6. wi·v/f¨vbMvox		
7. †U‡¤úv		
8. bwmgb/fUfwU		
9. BwÄb Pwjz †bŠKv		
10. Ab¨vb¨ (wbw`ó Ki“b)		

‡mKkb- 8: Kgms¯v‡bi m‡hvM

42. cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbv‡`i Kgms¯v‡bi m‡hvM †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, ci“l I gwnjv‡`i Kgms¯v‡bi m‡hvM †Kvb †Kvb †¶‡Î †e‡o‡Q ?

e‡i›` cK‡íi Kvi‡Y Kgms¯v‡bi m‡hvM †e‡o‡Q		Ab¨vb¨ cK‡íi Kvi‡Y Kgms¯v‡bi m‡hvM †e‡o‡Q	
ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb	ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb
1. Kwl KvR	1. Kwl KvR	1. Kwl KvR	1. Kwl KvR
2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl
3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb
4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb
5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR
6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb
7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR
8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR
9. Kwui wk‡íi KvR	9. Kwui wk‡íi KvR	9. Kwui wk‡íi KvR	9. Kwui wk‡íi KvR
10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv
11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR
12. PvKix	12. PvKix	12. PvKix	12. PvKix
13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b) .....

L. e‡i›` †mP cKí Qvov Ab¨vb¨ wK wK cKí Avcbvi GjvKvq ev¯ewqZ n‡q‡Q?

c‡et.....

.....

eZgv‡bt.....

.....

‡mKkb- 9: Kwl welqK Z_¨

43. e‡i›` cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Lv`¨ Drcv`b †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, cwZ weNvq wK cwigvb †e‡o‡Q?

c‡e t cwZ weNvq .....gY n‡Zv

eZgv‡b t cwZ weNvq .....gY nq

44. cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Kwl †¶‡Î k‡m¨i eûgLxKib (GKB Rwg‡Z GKwaK dmj Drcv`b) n‡”Q wK?

1. n¨v 2. bv

K. n¨v n‡j, KqwU dmj Drcw`Z nq? 1. `BwU 2. wZbwU 3. PviwU I Zvi †ekx

45. cK‡íi c‡e I eZgv‡b Drcw`Z Lv`¨ k‡m¨i cwigvb †Kgb?

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
1. NvUwZ n‡Zv 2. DØË _vK‡Zv 3. mgvb mgvb n‡Zv	1. NvUwZ nq 2. DØË _v‡K 3. mgvb mgvb nq

46. e‡i›` cK‡íi gva¨‡g †mP Kvhµg Pvj nIqvi c‡e I eZgv‡b k‡m¨i bvg, RvZ Ges dj‡bi cwigvb:
(ÔÔc‡e Ó ej‡Z wbw`ó GjvKvq e‡i›` cKí ev¯evq‡bi KvR †kI nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges ÔÔeZgv‡bÓ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 gvm †_‡K 12 gv‡mi GKUv Mo mgq)

dm‡ji bvg	Rwgi cwigvb (kZvs‡k)		RvZ: †KvW: 1. nvBexW 2. D"Pdjbkxj 3. ¯vbxq RvZ		djb (g‡Y)					
	c‡e	eZgv‡b	c‡e	eZgv‡b	1. nvBexW		2. D"Pdjbkxj		3. ¯vbxq RvZ	
					c‡e	eZgv‡b	c‡e	eZgv‡b	c‡e	eZgv‡b
K. avb:										
1. ‡ev‡iv										
2. AvDk										
3. Avgb										
L. Mg										
M. fÆv										
N. cvU										
O. AvL										
P. mwilv										
Q. Wvj RvZxq (gM/gmi/ KjvB)										
R. kvK-mewR										
1. cvjs kvK, WvUv										
2. Avj										
3. U‡g‡Uv/†e¸b										
4. djKwc/evavKwc/ IjKwc/ wmg										
5. gwiP/awbqv										
6. wgwó Kgov/PvjKgov/kkv										
S. dj (Avg, Kjv, †c‡c, Avbvim, ZigR BZ¨vw`)										
T. Ab¨vb¨ (wbw`ó Ki"b)...										

47. e‡i›` cK‡íi gva¨‡g †mP Kvhµg Pvj nIqvq c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq mv‡ii e¨envi †Kgb?

mv‡ii bvg	c‡e : ‡KvW: 1. nZ bv 2. Kg 3. †e‡k	eZgv‡b : ‡KvW: 1. nq bv 2. Kg 3. †e‡k
1. BDwiqv		
2. wUGmwc		
3. Ggwc		
4. wgk mvi		
5. ^Re mvi		
6. Ab¨vb¨ (wbw`ó Ki“b)		

K. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq dm‡j †cvKvgvKo I †ivMevjvB‡qi Avµgb †Kgb?

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
1. wQj bv 2. Kg wQj 3. †e‡k wQj	1. ‡bB 2. Av‡Mi †P‡q Kg 3. Av‡Mi †P‡q †e‡k

L. evjvB `g‡bi Rb¨ wK cwigvb KxUbvkK e¨envi K‡i‡Qb?

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
1. e¨envi Kwi bvB 2. Kg 3. †ekx	1. e¨envi Kwi bv 2. Kg 3. †ekx

M. c‡e Ges eZgv‡b †Kvb †Kvb dm‡j KxUbvkK e¨envi Ki‡Zb Ges K‡ib?

c‡e t.....

eZgv‡bt.....

48. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq e¶‡ivcb †e‡o‡Q wK?

1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi e¶‡ivcb †ekx n‡”Q?

1. djR 2. ebR 3. Jlax 4. Ab¨vb¨ (wbw`ó Ki“b).....

49. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq gv‡Qi Drcv`b †e‡o‡Q wK?

1. n¨v 2. bv

50. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq nvm-giMx cvjb †e‡o‡Q wK?

1. n¨v 2. bv

51. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq c‡ï cvjb †e‡o‡Q wK?

1. n¨v 2. bv

52. e‡i›` ‡mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq cwb ewnZ †iv‡Mi c‡Kvc ‡Kgb n‡q‡Q?

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
1. wQjbv 2. Kg 3. ‡ekx	1. †bB 2. Kg 3. ‡ekx

‡mKkb- 10: cwi‡ekMZ cfve

53. e‡i›` cK‡íi d‡j cwi‡e‡ki Dci wK ai‡bi BwZevPK/fvj cfve c‡o‡Q? .....

.....

54. e‡i›` †mP cKí ev¯evq‡bi d‡j cwi‡e‡ki Dci †Kvb ¶wZKviK cfve c‡o‡Q wK ? 1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi ¶wZKviK cfve c‡o‡Q ?

1. ‡ivM RxevY I gkv gwQi c‡Kvc †e‡o‡Q
2. Rwgi DeiZv K‡g‡Q
3. g³ cwb‡Z grm¨ Pvl eÜ n‡q‡Q
4. evjvBbvkK e¨envi‡ii ewn×
5. ivmvqwbK mv‡ii e¨envi ewn×
6. Ddmx dm‡ji Pvlvev` †e‡o‡Q
7. Rjve×Zv ewn× †c‡q‡Q
8. Ab¨vb¨ (wb‡`ó Ki“b) .....

55. e‡i›` †mP cKí ev¯evq‡bi d‡j ¯vbxq Rv‡Zi dm‡ji cwie‡Z D”Pdjbkxj Rv‡Zi dmj Drcv`‡bi d‡j cwi‡e‡ki Dci †Kvb cfve c‡i‡Q wK?

1. n¨v 2. bv

K. e‡i›` †mP cKí ev¯evq‡bi d‡j evjvBbvkK e¨envi‡ii d‡j cwi‡ek `lY †e‡o‡Q wK? 1. n¨v 2. bv

L. e‡i›` †mP cKí ev¯evq‡bi d‡j †QvU gv‡Qi Drcv`b c‡ei Zjbvq eZgv‡b K‡g‡Q wK? 1. n¨v 2. bv

M. e‡i›` †mP cKí ev¯evq‡bi d‡j gv‡Qi ‡iv‡Mi cwigvb †e‡o‡Q wK? 1. n¨v 2. bv

N. e‡i›` †mP cKí ev¯evq‡bi d‡j Rjve×`v †e‡o‡Q wK? 1. n¨v 2. bv

O. n¨v n‡j, Rjve×Zvi Kvi‡b cwi‡e‡ki Dci wK ai‡bi cfve c‡i‡Q? .....

.....

‡mKkb- 11t cK‡íi mdj I `ej w`K mgn

56. e‡i›` ‡mP e¨e¯v (f-Mf¯ cvBc/cvKv †mPbvjv) ev¯evq‡bi d‡j Avcbv‡`i wK wK DcKvi ev mwnZv n‡q‡Q?

.....

.....

57. e‡i›` ‡mP e¨e¯v (f-Mf¯ cvBc/cvKv †mPbvjv) ev¯evq‡bi d‡j Avcbv‡`i wK wK AmwnZv n‡q‡Q?

.....

.....

58. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi Kvhµg†K wKfv‡e Av‡iv DbZ Kiv hvq ?

.....

.....

.....

kagvÎ wewnZ gwnjv‡`i Rb¨ ckvejx

59. DËi`vÎxi bvg: ..... K. MnKZvi mv‡_ m¤úK: .....

L. DËi`vÎxi eqm: ..... M. DËi`vÎxi wk¶vMZ †hvM¨Zv: ..... (m‡ev"P †kYx cvm K‡i‡Qb)

N. DËi`vÎxi †ckv: c‡e (Kgc‡¶ 5 eQi c‡ei mgq): ..... eZgv‡b: .....

O. DËi`vÎx A_Kix Kv‡R wb‡qwRZ _vK‡j wR‡Ám Ki"b, Zvi gwmK Mo Avq:

c‡e (Kgc‡¶ 5 eQi c‡ei mgq) KZ UvKv: ..... eZgv‡b KZ UvKv: .....

60. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi ev¯evq‡bi †Kvb ai‡bi Kv‡R Avcbvi AskMnY wQj wK?
1. n¨v 2. bv (61 bs c‡k hvb)

K. n¨v n‡j, Avcwb wK ai‡bi KvR K‡iwQ‡jb? .....

L. e‡i›` cK‡íi Kv‡R AskMnY K‡i Avcwb †Kvb fvZv ev gRix †c‡q‡Qb wK? 1. n¨v: ‰`wbK: .....UvKv 2. bv

M. ci"‡li Zjbvq gRix Kg †`Iqv n‡q‡Q wK? 1. n¨v: KZ?: ..... UvKv 2. bv

61. e‡i›` f-Mf¯ cvBc/cvKv ‡mPbvjvi cwb Avcwb wK wK Kv‡R e¨envi Ki‡Qb? .....

.....

K. cK‡íi d‡j Avcbvi cwiev‡ii Avq †e‡o‡Q wK? 1. n¨v: ..... UvKv (gwmK) 2. bv

62. cKí ïi"i c‡e Ges c‡i Avcbviv wK ai‡bi Lv`¨ MnY K‡i _v‡Kb?

Lv‡`¨i bvg	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)		eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)	
	w`‡b KZevi	mvZ w`‡b KZevi	w`‡b KZevi	mvZ w`‡b KZevi
1. fvZ				
2. i"wU				
3. Wvj				
4. gvQ				
5. gvsm				
6. wWg				
7. `a/`aRvZ `e¨				
8. kvK-mewR				
9. dj				
10. Ab¨vb¨ (wbw`ó Ki"b)				

63. e‡i›` †mP cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b †Q‡j‡g‡q‡`i ¯‹j/K‡jR/gv`vmvq wk¶vi m‡hvM †e‡o‡Q wK?
1. n¨v 2. bv

K. Avcbvi cwiev‡i wk¶v cwZôv‡b hvIqvi Dc‡hvMx mšvb KZRb Ges KZRb †h‡Z cviZ Ges cv‡i?

c‡e	K. wk¶v cwZôv‡b hvIqvi Dc‡hvMx m`‡m¨i msL¨v:.....Rb L. Gi g‡a¨ †Q‡j KZRb †hZ:.....Rb M. Gi g‡a¨ †g‡q KZRb †hZ:.....Rb
eZgv‡b	K. wk¶v cwZôv‡b hvIqvi Dc‡hvMx m`‡m¨i msL¨v:.....Rb L. Gi g‡a¨ †Q‡j KZRb hvq:.....Rb M. Gi g‡a¨ †g‡q KZRb hvq:.....Rb

64. cK‡íi c‡e I eZgv‡b Drcw`Z Lv`¨ k‡m¨i cwigvb †Kgb?

c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12gv‡mi GKUv Mo mgq)
1. NvUwZ n‡Zv 2. DØË _vK‡Zv 3. mgvb mgvb n‡Zv	1. NvUwZ nq 2. DØË _v‡K 3. mgvb mgvb nq

65. e‡i›` cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq e¶‡ivcb †e‡o‡Q wK? 1. n¨v 2. bv

66. e‡i›` cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq gv‡Qi Drcv`b †e‡o‡Q wK? 1. n¨v 2. bv

67. e‡i›` cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq nvm-giMx cvjb †e‡o‡Q wK? 1. n¨v 2. bv

68. e‡i›` cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbvi GjvKvq cï cvjb †e‡o‡Q wK? 1. n¨v 2. bv

69. e‡i›` cK‡íi d‡j cwi‡e‡ki Dci wK ai‡bi BwZevPK/fvj cfve c‡o‡Q? .....

.....

.....

70. e‡i›` cK‡íi d‡j cwi‡e‡ki Dci wK ai‡bi ¶wZKviK cfve c‡o‡Q?

1. ‡ivM Rxeb I gkv gwQi c‡Kvc †e‡o‡Q 2. Rwgi DeiZv K‡g‡Q 3. g³ cwb‡Z grm¨ Pvl eÜ n‡q‡Q 4. evjvBbvkK e¨envi‡i ew× 5. Ddmx dm‡ji Pvlvev` †e‡o‡Q	6. ivmvqwbK mv‡ii e¨envi ew× 7. Rjve×Zv ew× †c‡q‡Q 8. ‡Kvb ¶wZKviK cfve c‡iwb 9. Ab¨vb¨ (wbw`ó Ki“b) .....

71. cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b Avcbv‡`i Kgms¯vfbi m‡hvM †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, ci“l I gwnjv‡`i Kgms¯vfbi m‡hvM †Kvb †¶‡Î †e‡o‡Q ?

e‡i›` cK‡íi Kvi‡Y Kgms¯vfbi m‡hvM †e‡o‡Q		Ab¨vb¨ cK‡íi Kvi‡Y Kgms¯vfbi m‡hvM †e‡o‡Q	
ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb	ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb
1. KwI KvR	1. KwI KvR	1. KwI KvR	1. KwI KvR
2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl
3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb
4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb
5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR
6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb
7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR
8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR
9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR
10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv
11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR
12. PvKix	12. PvKix	12. PvKix	12. PvKix
13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b) .....

L. ci“l I gwnjv‡`i Kgms¯vfbi m‡hvM evovi KviY¸‡jv wK wK? .....

.....

72. Avcbvi GjvKvq †Kvb GbwRI/DbqbgjK cwZôvb KvR K‡i wK? 1. n¨v 2. bv 3. Rwbbv

73. Avcwb †Kvb GbwRI/DbqbgjK cwZôv‡bi m`m¨ wK? 1. n¨v 2. bv

74. cK‡íi d‡j gwnjv‡iv c‡ei Zjbvq eZgv‡b wewfb DbqbgjK Kv‡R †ekx AskMnY Ki‡Q wK?

1. n¨v 2. bv

75. e‡i›` cKí ev¯evq‡bi d‡j Avcbvi Mv‡g c‡ei Zjbvq eZgv‡b gwnjv‡`i wK ai‡bi Av_-mvgwRK Ae¯vi DbœZ n‡q‡Q?

1. A_‰bwZK DbœZ n‡q‡Q	5. Rxeb hvÎvi gvb †e‡o‡Q
2. mvgwRK DbœZ n‡q‡Q	6. gwnjv‡`i ¶gZvqb †e‡o‡Q
3. wk¶vi DbœZ n‡q‡Q	7. Ab¨vb¨ (wbw`ó Ki“b) .....
4. ¯v¯¨‡mevi DbœZ n‡q‡Q	

76. e‡i›` ‡mP e¨e¯v (f-Mf¯ cvBc/cvKv †mPbvjv) ev¯evq‡bi d‡j Avcbv‡`i wK wK DcKvi ev mweav n‡q‡Q?

.....

.....

.....

77. e‡i›` ‡mP e¨e¯v (f-Mf¯ cvBc/cvKv †mPbvjv) ev¯evq‡bi d‡j Avcbv‡`i wK wK Amweav n‡q‡Q?

.....

.....

.....

ab¨ev` w`‡q mv¶vrKvi MnY †kl Ki“b

diɑ-2

e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí

wbweo Av‡jvPbvi ckgvjv

BDwbqb chv‡qi cwk¶Yv_x‡`i Rb¨

‡Km bst

fwgKv: Avmmvjvg AvjvBKg| Avgiv ixW bvgK M‡elYv cwZôvb Ges cwiKíbv gšYvj‡qi AvBGgBwW (IMED) Gi c¶ †_‡K gvV chv‡q gj¨vqb Rix‡ci D‡Ï‡k¨ G‡mwQ| Avcbviv Rv‡bb e‡i›` eûgLx Dbqb KZc¶ (BMDA)-KZK 1996-2006 mv‡j evsjv‡`‡ki 3wU †Rjvi 25wU Dc‡Rjvq e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí bv‡g GKwU cK‡íi KvR ev¯—ewqZ n‡q‡Q, hvi D‡Ïk¨ wQj AÎ Mfxi bjKc GjvKvq f-Mf¯— cvBc/cvKv †mPbvjv wbgvY K‡i cwbi AcPq †iv‡ai gva¨‡g †mP GjvKv ew×i cvkvcwk GjvKvq `wi` I wcwQ‡q _vKv Rb‡MwôK AvaywbK PvIev‡`i Kjv †KŠkj I DbZ Rxeb e¨e¯—vi mv‡_ cwiPq NwU‡q Zv‡`i Av_-mvgwRK Ae¯—vi Dbqb Kiv| eZgvb Rix‡ci D‡Ïk¨ n‡"Q f-Mf¯— cvBc /cvKv †mPbvjv wbgv‡bi Ae¯—v, †m‡Pi cwb mieiv‡ni AMMwZ, cwbi e¨envi I e¨e¯—vcbv, cwbi AcPq †iva, AvawbK chw³ c‡qv‡Mi gva¨‡g dmj Drcv`b I Gi gva¨‡g Av_-mvgwRK Ae¯—vi Dbqb KZUK n‡q‡Q Zv gj¨vqb Kiv|

G cm‡½ Avcwb Avcbvi gj¨evb Z_¨ c`v‡bi gva¨‡g GB M‡elYvq Ae`vb ivL‡Z cv‡ib| Avcbvi AskMnY m¤úYfv‡e Avcbvi Dci wbfi Ki‡Q| Avcbvi gZvgZ ïagvÎ M‡elYvi Kv‡R e¨eüZ n‡e Ges Avcbvi †`qv Z_¨ m¤úY ‡Mvcb ivLv n‡e| Avcbvi AbgwZ †c‡j Awg mv¶vrKvi ïi“ Ki‡Z cwi|

wefvM :	†KvWbs : .....
‡Rjv :	†KvWbs : .....
Dc‡Rjv :	†KvWbs : .....
BDwbqb :.....	†KvW bs : .....
‡gŠRv/IqvW bs :	‡KvW bs : .....
Mvg :	‡KvW bs : .....

B›UviwfDqvi‡`i Rb¨ wb‡`kbvt B›UviwfDqvi mv¶vrKvi ïi“i Av‡M †_‡KB DËi`vZv‡K ckgvjvq D‡jwLZ Óc‡e Ges eZgv‡b Ó mg‡qi e¨vL¨v w`‡q wb‡eb| Ôc‡e Ô Ges ÔeZgv‡biÔ e¨vL¨v n‡jvt 1. Ôc‡e Ô A_vr wbw`ó GjvKvq e‡i›` cKí ev¯—evq‡bi KvR †kl nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges 2. ÔeZgvbÔ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 gvm †_‡K 12 gv‡mi GKUv Mo mgq| mg‡qi GB wn‡m‡e Óc‡e Ges eZgvbÓ mg‡qi Z_¨ Avb‡Z n‡e|

1. cwk¶bv_x DËi `vZvi bvg: ..... †dvb bv¤vi (hw` _v‡K): .....

2. wj½: 1. ci"l 2. gwnjv

3. eqm: ..... eQi

4. wk¶vMZ †hvM¨Zv: ..... (m‡ev"P ‡h †kYx cvm K‡i‡Qb)

5. ‡ckv: cwk¶‡Yi c‡e: .....eZgv‡b: .....

‡mKkb 1t cwk¶Y welqK gj¨vqb

6. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq Avcwb †Kvb cwk¶Y †c‡q‡Qb wK? 1. n¨v 2. bv

K. n¨v n‡j, D³ cK‡íi AvIZvq Avcwb †Kvb ai‡bi cwk¶Y †c‡q‡Qb?

cwk¶‡Yi aiY	L. cwk¶‡Yi welqe¯ wK wK wQj?	M. ‡Kvb mv‡j cwk¶Y †c‡q‡Qb?	N. KZw` ‡bi cwk¶Y †c‡q‡Qb?	O. Avcbvi mv‡_ GKB e¨v‡P †gvU KZRb cwk¶Y wb‡qwQj?..Rb
1. Av`k KIK				
2. bjKc Acv‡iUi/ ‡Wbg¨vb/Kcb wWjvi				
3. ‡gKwbK mnKvix				
4. ebvqb/bvmvix Kgx				
5. grm¨Pvlx				
6. Kwl hvšxKviK				
7. Ab¨vb¨ (wbw`ó Ki"b)				

P. Kviv cwk¶Y w`‡q‡Qb?
1. e‡i›` eûgLx Dbqb KZc‡¶i (weGgwWG) cwk¶KMY 2. †mP wefv‡Mi KgKZv
3. Kwl m¤cmvib wefv‡Mi KgKZv 4. eb wefv‡Mi KgKZv
5. grm¨ wefv‡Mi KgKZv 6. cïcvjb wefv‡Mi KgKZv 7. Ab¨vb¨ (wbw`ó Ki"b) .....

Q. cwk¶‡Y wK wK DcKiY e¨envi Kiv n‡qwQj? .....

.....

7. nv‡Z Kj‡g †Kvb cwk¶Y †`qv n‡q‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, †Kvb †Kvb wel‡q nv‡Z Kj‡g cwk¶Y †`qv n‡q‡Q? .....
.....

8. cwk¶K‡`i Ávb, `¶Zv I Dc¯vcbv †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

K. cwk¶‡Yi gvb †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

L. cwk¶Y ¯vb/i“g m¤ú‡K gZvgZ t

welq (c‡Z¨KwU welq c‡o †kvbvb)	†KvWt 1. Le fvj 2. fvj 3. ‡gvUvgwU 4. Lvivc 5. Le Lvivc 6. e¨e¯v wQjbv
1. mweK cwi‡ek	
2. emvi e¨e¯v	
3. evm¯vb	
4. Lvevi	
5. hvZvqvZ	
6. cwk¶Y DcKib	
7. hšcwZ	
8. Ab¨vb¨ (wbw`ó Ki“b)	

9. cwk¶YwU mdj fv‡e n‡q‡Q wK? 1. n¨v 2. bv

K. bv n‡j, Gi mgm¨v¸‡jv wK wK wQj? .....

.....

10. GB cK‡íi cwk¶Y †_‡K †h me Ávb I `¶Zv ARb K‡i‡Qb Zv Avcbvi †Kvb Kv‡Ri mnvqZv n‡q‡Q ev Kv‡R †j‡M‡Q wK?
1. n¨v 2. bv

K. n¨v n‡j, Avcbvi †Kvb ‡Kvb Kv‡Ri mnvqZv n‡q‡Q ev wKfv‡e Kv‡R jvMv‡”Qb? .....

.....

L. hw` bv nq, Zvn‡j †Kb? .....

.....

11. Avcbvi g‡Z cwk¶‡Yi mgq h‡_ó wQj wK? 1. n¨v 2. bv

K. hw` bv nq, Z‡e cwk¶YwU KZ w`‡bi nlqv DwPr? .....

12. cwk¶‡Yi welqe¯ mn‡R eS‡Z †c‡i‡Qb wK? 1. n¨v 2. bv

K. hw` bv nq, Z‡e ‡Kb? .....

.....

13. Avcwb wK g‡b K‡ib cwk¶‡Y Dc¯vcbKZ welqe¯ n‡Z †Kvb welq Ašf³ A_ev ev` †`qvi `iKvi Av‡Q?
1. n¨v 2. bv

K. hw` n¨v nq, ‡Kvb ‡Kvb welq Ašf³/ms‡hvRb Kiv c‡qvRb? .....

.....

L. hw` n¨v nq, ‡Kvb welq ev` †`qv c‡qvRb? .....

.....

14. cwk¶YwU‡K fwel¨‡Z Av‡iv ‡Rvi`vi Ki‡Z wK wK c`‡¶c †bqv †h‡Z cv‡i? .....

.....

15. Avcbvi Kg`¶Zv evov‡bvi Rb¨ fwel¨‡Z Avi I cwk¶‡Yi c‡qvRb Av‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, †Kvb †Kvb wel‡qi Dci Avcbvi cwk¶‡Yi c‡qvRb? .....

.....

‡mKkb 2t cwk¶‡Yv_x‡`i wbw`ó `wqZ Ges ‡m wel‡q Zv‡`i gZvgZ

16. e‡i›` cK‡íi (Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjv) ‡Kvb Kv‡Ri mv‡_ Avcwb RwoZ Av‡Qb wK? 1. n¨v 2. bv

K. n¨v n‡j, Avcwb †Kvb Kv‡Ri mv‡_ RwoZ? .....

.....

L. D³ Kv‡R Avcbvi `wqZ wK wK? .....

.....

17. Avcbv‡K wKfv‡e D³ Kv‡Ri mv‡_ ev †Kqvi‡UKvi wn‡m‡e wbevPb Kiv n‡q‡Q? .....

.....

18. (hviv †givgZ I i¶Yv‡e¶‡Yi Kv‡R RwoZ Zv‡`i‡K wR‡Ám Ki"b) †givgZ I i¶Yv‡e¶‡Yi wel‡q cwk¶‡Yi mgq †Kvb hšcwZ †`qv n‡q‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, wK wK hšcwZ †`qv n‡q‡Q? .....

19. Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjvi i¶Yv‡e¶‡bi KvR †K ev Kviv K‡i _v‡Kb?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki"b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki"b) .....

K. †givgZ I i¶Yv‡e¶‡bi LiP †K enb K‡i?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki"b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki"b) .....

20. Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjvi †givgZ I i¶Yv‡e¶‡Yi KvR wKfv‡e K‡ib ev Kiv nq? .....

.....

.....

21. i¶Yv‡e¶Y I †givg‡Zi e¨vcv‡i e‡i›` eûgLx Dbqb KZc¶ (weGgwWG)-Gi KvQ †_‡K wK ai‡bi mnvqZv cvb?

.....

.....

22. Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi ci †m‡Pi cwbi e¨envi h_vh_ n‡"Q wKbv ev †Kvb cKvi mgm¨v †`Lv w`‡q‡Q wKbv - Zv ‡`Lvi Rb¨ e‡i›` eûgLx Dbqb KZc¶ (weGgwWG) †Kvb d‡jvAvc K‡i‡Q wK?

1. n¨v 2. bv

23. e‡i›` cK‡í ev¯ewqZ AeKvVv‡gv¸‡jv mwVKfv‡e KvR Ki‡Q wK?

K. Mfxi bjKc mwVKfv‡e KvR Ki‡Q wK? 1. n¨v 2. bv
L. f-Mf¯ cvBc †mPbvjv mwVKfv‡e KvR Ki‡Q wK? 1. n¨v 2. bv 3. c‡hvR¨ bq
M. cvKv †mPbvjv mwVKfv‡e KvR Ki‡Q wK? 1. n¨v 2. bv 3. c‡hvR¨ bq

24. Avcbvi AvIZvaxb e‡i›` cK‡íi Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjvi eZgvb Ae¯v †Kgb?

	eZgvb Ae¯v	gše¨ (†h Ae¯vi K_v ej‡e †m m¤ú‡K gše¨)
1. Mfxi bjKc	1. Le fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q)	
2. f-Mf¯ cvBc †mPbvjv	1. Le fvj (wQ`/dvUv/fv½v BZ¨w` bvB 2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q)	
3. cvKv †mPbvjv	1. Le fvj (wQ`/dvUv/fv½v BZ¨w` bvB 2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q)	

25. e‡i›` cKí (Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv) Kivi d‡j Avcbv‡`i wK wK DcKvi ev mwea v n‡q‡Q?

.....

.....

.....

26. e‡i›` cKí (Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv) Kivi d‡j Avcbv‡`i wK wK Amwea v n‡q‡Q?

.....

.....

.....

27. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi Kvhµg†K wKfv‡e Av‡iv DbZ I KvhKi Kiv hvq ?

.....

.....

.....

Avcbvi mn‡hvMxZvi Rb¨ Avcbv‡K ab¨ev`

dig-3

e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí

wbweo Av‡jvPbvi ckgvjv
(Dc‡Rjv chv‡qi KgKZv‡`i Rb¨)

‡Km bst

fwgKv: Avmmvjvg AvjvBKg| Avgiv ixW bvgK M‡elYv cwZôvb Ges cwiKíbv gšYvj‡qi AvBGgBwW (IMED) Gi c¶ †_‡K gvV chv‡q gj¨vqb Rix‡ci D‡Ï‡k¨ G‡mwQ| Avcbviv Rv‡bb e‡i›` eûgLx Dbqb KZc¶ (BMDA)-KZK 1996-2006 mv‡j evsjv‡`‡ki 3wU †Rjvi 25wU Dc‡Rjvq e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí bv‡g GKwU cK‡íi KvR ev¯—ewqZ n‡q‡Q, hvi D‡Ïk¨ wQj AÎ Mfxi bjKc GjvKvq f-Mf¯— cvBc/ cvKv †mPbvjv wbgvY K‡i cwbi AcPq †iv‡ai gva¨‡g †mP GjvKv ew×i cvkvcwk GjvKvq `wi` I wcwQ‡q _vKv Rb‡Mwô‡K AvaywbK Pvlvev‡`i Kjv †KŠkj I DbZ Rxeb e¨e¯—vi mv‡_ cwiPq NwU‡q Zv‡`i Av_-mvgwRK Ae¯—vi Dbqb Kiv| eZgvb Rix†ci D‡Ïk¨ n‡"Q f-Mf¯— cvBc/ cvKv †mPbvjv wbgv‡bi Ae¯—v, †m‡Pi cwb mieiv‡ni AMMwZ, e¨envi, cwbi AcPq †iva, AvaywbK chw³ c‡qv‡Mi gva¨‡g dmj Drcv`b I Gi gva¨‡g Av_-mvgwRK Ae¯—vi Dbqb KZUK n‡q‡Q Zv gj¨vqb Kiv|

G cm‡½ Avcwb Avcbvi gj¨evb Z_¨ c`v‡bi gva¨‡g G M‡elYvq Ae`vb ivL‡Z cv‡ib| Avcbvi AskMnY m¤úYfv‡e Avcbvi Dci wbfi Ki‡Q| Avcbvi gZvgZ ïagvÎ M‡elYvi Kv‡R e¨eüZ n‡e Ges Avcbvi †`qv Z_¨ m¤úY ‡Mvcb ivLv n‡e| Avcbvi AbgwZ †c‡j Awg mv¶vrKvi ïi“ Ki‡Z cwi|

wefvM :	†KvWbs : .....
‡Rjv :	†KvWbs : .....
Dc‡Rjv:	†KvW bs : .....

mv¶vrKvi MnbKvixi bvg :	mv¶vrKvi Mn‡bi ZwiL: .....
mcvifvBRv‡ii bvg :	ZwiL: .....
mv¶vrKvi Mnb: ïi“i mgq :	‡kl mgq: .....

B›Uvi wfDqvi‡`i Rb¨ wb‡`kbvt B›Uvi wfDqvi mv¶vrKvi ïi“i Av‡M †_‡KB DËi`vZv‡K ckgvjvq D‡jwLZ Óc‡e Ges eZgv‡b Ó mg‡qi e¨vL¨v w`‡q wb‡eb| Ôc‡e Õ Ges ÔeZgv‡bi Õ e¨vL¨v n‡jvt 1. Ôc‡e Õ A_vr wbw`ó GjvKvq e‡i›` cKí ev¯—evq‡bi KvR †kl nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges 2. ÔeZgvbÕ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 gvm ‡_‡K 12 gv‡mi GKUv Mo mgq| mg‡qi GB wn‡m‡e Óc‡e Ges eZgvbÓ mg‡qi Z_¨ Avb‡Z n‡e|

1. bvg : ..... †dvb bv¤vi : .....

2. c`ex: .....

3. wk¶vMZ †hvM¨Zv: .....

4. KgGjvKv: .....

5. Avcwb G KgGjvKvq KZw`b hver wb‡qwRZ Av‡Qb? .....eQi .....gvm

6. eZgvb c‡` Avcbvi `wqZ wK wK? .....

.....

7. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi Kv‡R Avcwb wK RwoZ wQ‡jb? 1. n¨v 2. bv

K. n¨v n‡j, D³ cK‡íi Avcwb wK `wqZ cvjb K‡i‡Qb? .....

.....

.....

‡mKkb 1t e‡i›` †mP cKí m¤úwKZ Z_¨

8. j¶¨gvÎv Abhvqx D³ cK‡íi KvR mwVKfv‡e ev¯—ewqZ n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, wK wK Kvi‡Y ev¯—ewqZ nqwb? .....

.....

9. cK‡íi KvR eivÏKZ A‡_ m¤úb n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, †Kb ‡kl nqwb? .....

.....

10. cK‡í e¨eüZ gvjvgvj msµvš †Kvb mgm¨v n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wK ai‡bi mgm¨v n‡qwQj? .....

.....

11. cKí ev¯—evqbKvjxb mg‡q cK‡íi KvR m‡iRwg‡b cwi`kb/Z`viwK Kiv n‡q‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e Kiv nZ? .....

.....

12. e‡i›` cKí ev¯—evq‡bi †¶‡Î ‡Kvb mgm¨v n‡q _vK‡j wK ai‡bi mgm¨v n‡qwQj? .....

.....

K. wKfv‡e mgm¨v mgvavb Kiv n‡qwQj? .....

.....

13. cKí ev¯evqbKv‡j ¯vbxq cwZwbwa ai gva¨‡g †Kvb mcvi wfkb KwgwU wQj wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, †Kb Kiv nqwb? .....

.....

14. cKí ev¯evqbKv‡j ¯vbxq cwZwbwa‡`i †Kvb gZvgZ †bIqv n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e? .....

.....

15. e‡i›` cKí ev¯evq‡bi mgq fwg/Rwg AwaMn‡Yi †¶‡Î ‡Kvb mgm¨v n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wK ai‡bi mgm¨v n‡qwQj? .....

.....

16. cKí GjvKvq cwb e¨e¯vcbv mwgwZ ev `j i‡q‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, mwgwZ ev `j wK wK KvR K‡i _v‡K? .....

.....

17. e‡i›` cKí (Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjv) ev¯evq‡b ¯vbxq RbM‡Yi AskMnY †Kgb wQj?

.....

.....

18. e‡i›` cKí ev¯evqbKv‡j gwnjv‡`i AskMnb wbwðZ Kiv n‡qwQj wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e? .....

.....

L. bv n‡j, †Kb? .....

.....

19. e‡i›` cK‡í ev¯ewqZ AeKvVv‡gv¸‡jv mwVKfv‡e KvR Ki‡Q wK?

K. Mfxi bjKc mwVKfv‡e KvR Ki‡Q wK?	1. n¨v	2. bv
L. Mfxi bjKc mswkó Uvlqvi mwVKfv‡e KvR Ki‡Q wK?	1. n¨v	2. bv
M. e‡i›` cvBc †mPbvjv mwVKfv‡e KvR Ki‡Q wK?	1. n¨v	2. bv
N. cvKv †mPbvjv mwVKfv‡e KvR Ki‡Q wK?	1. n¨v	2. bv

20. cKí GjvKvq ‡m‡Pi cwb e›Ub I mieiv‡ni `wqZ †K cvjb K‡ib?.....

21. e‡i›` cK‡íi AvIZvq ¯wcZ Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv i¶Yv‡e¶‡Yi `wqZ. †K ev Kviv cvjb K‡ib?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g KwgwU 5. Ab¨vb¨ (wbw`ó Ki“b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g KwgwU 5. Ab¨vb¨ (wbw`ó Ki“b) .....

22. ev¯ewqZ cKí mwVKfv‡e i¶Yv‡e¶Y Kiv nq wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e? .....

.....

23. i¶Yv‡e¶Y Kv‡R A‡_i ms¯‹vb Av‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, G Kv‡R A‡_i ms¯‹vb h‡_ó wK? 1. n¨v 2. bv 3. Rwbbv

L. GB i¶Yv‡e¶Y Kv‡R A‡_i Drm wK? .....

24. cK‡íi eivÏKZ e¨q KZ wQj? 1. .....UvKv 2. Rwbbv

25. cK‡íi †gvU e¨q KZ? 1. .....UvKv 2. Rwbbv

26. Avcbvi Mv‡g †gŠmg †f‡` cwb mieiv‡ni Ae¯v I cwb e¨env‡ii nvi †Kgb _v‡K?

‡gŠmg	K. cwb mieiv‡ni Ae¯v †Kgb? †KvW: 1. chvß 2. Achvß 3.cvIqv hvq bv		L. †Kvb ‡gŠm‡g ‡Kgb †m‡Pi cwb e¨envi K‡ib? †KvW: 1. chvß 2. Achvß 3. cvIqv hvq bv 4. c‡qvRb nqbv	
	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6-12 gv‡mi GKUv Mo mgq)	c‡e (mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq)	eZgv‡b (mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 -12 gv‡mi GKUv Mo mgq)
1. iwe (KwZK-dvêb ev A‡±vei-gvP)				
2. Lwic-1 (^PÎ-AvIvp ev gvP-Rb)				
3. Lwic-2 (kveb-Awkb ev RjvB-A‡±vei)				
4. mviv eQi				

27. cK‡íi AvIZvq mviv eQi †mPbvjv †_‡K chvß cwigvY †m‡Pi cwb cvIqv hvq wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, eQ‡ii †Kvb mg‡q †m‡Pi cwb cvIqv hvq bv/Afve nq? .....

L. †Kb cvIqv hvq bv/Afve nq? .....

.....

28. e‡i›` GjvKvq mwea‡fvMxiv †mPbvjvi cwb mwVKfv‡e †mP Kv‡h e¨envi Ki‡Z cvi‡Q wK? 1. n¨v 2. bv

29. f-Mf¯ cvBc I cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq eZgv‡b cwbi AcPq K‡g‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, cwbi AcPq KZfvM K‡g‡Q ev †iva n‡q‡Q?

c‡e t .....% n‡Zv	eZgv‡b t .....% nq

30. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq eZgv‡b wevNv cwZ †mP LiP K‡g‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, KZ K‡g‡Q?

c‡e t .....UvKv wQj (cwZ wevNvq)	eZgv‡b t .....UvKv n‡q‡Q (cwZ wevNvq)

31. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi d‡j Avcbvi Mfxi bjK‡ci KgvÛ GjvKvq Kwl Rwgi kZKiv KZfvM †m‡Pi Avl Zvq G‡m‡Q?

c‡e t 1. .....% Rwg wQj 2. Rwbbv	eZgv‡b t 1. .....% Rwg n‡q‡Q 2. Rwbbv

32. mwea†fvMx‡`i e‡i›` cK‡íi †m‡Pi cwb e¨env‡ii PvR /A_ wKfv‡e w`‡Z nq?

1. bM` UvKv 2. wc‡cBW Kv‡Wi gva¨‡g 3. dm‡ji A‡aK
4. dm‡ji wZb fv‡Mi GK fvM 5. dm‡ji Pvi fv‡Mi GK fvM 6. Ab¨vb¨ (wb‡`ó Ki“b).....

K. bM` UvKv ev wc‡cBW Kv‡Wi gva¨‡g w`‡Z n‡j, GK wevNvq KZ UvKv w`‡Z nq? .....UvKv

33. ‡mP hš wKfv‡e Pwjz nq?

1. we`¨r Øviv 2. wW‡Rj Øviv 3. Ab¨vb¨ (wb‡`ó Ki“b) .....

34. cK‡íi Mfxi bjK‡ci mvnv‡h¨ cwb D‡Ëvjb I f-Mf¯ cvBc/cvKv †mPbvjvi gva¨‡g cwb mieivn-Gi †¶‡Î wK wK mgm¨v nq?

.....

.....

K. wKfv‡e mgm¨v mgvavb Kiv nq? .....

.....

35. e‡i›` †mP cKí ev¯evq‡bi gva¨‡g Rbmvavi‡Yi Av_-mvgwRK Ae¯v I Rxebavi‡Yi gvb`Û DbZ n‡q‡Q e‡j Avcwb g‡b K‡ib wK? 1. n¨v 2. bv

K. n¨v n‡j, wKfv‡e? .....

.....

L. bv n‡j, †Kb? .....

.....

‡mKkb 2t cwk¶Y welqK gj¨vqb

36. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq wK ai‡bi, KZRb‡K, wK wel‡q I KZw`‡bi cwk¶Y †`lqv n‡qwQj?

K. cwk¶‡Yi aiY	L. KZRb‡K cwk¶Y †`lqv n‡qwQj? (msL¨v)	M. cwk¶‡Yi welqe¯wK wK wQj?	N. KZw`‡bi cwk¶Y †`lqv n‡qwQj? (w`b)
1. Av`k KlK			
2. bjKc Acv‡iUi/ ‡Wbg¨vb/Kcb wWjvi			
3. ‡gKwbK mnKvix			
4. ebvqb/bvmvix Kgx			
5. grm¨Pvlx			
6. Kwl hvšxKviK			
7. Ab¨vb¨ (wbw`ó Ki“b)			

0. †Kvb ¯v‡b cwk¶Y †`lqv n‡qwQj? .....

P. cwk¶K/wi‡mvm cv‡mv‡bj wn‡m‡e †Kvb ms¯vi KgKZvMY cwk¶Y w`‡q‡Qb?

1. e‡i›` eûgLx Dbqb KZc‡¶i (weGgwWG) cwk¶K
2. †mP wefv‡Mi KgKZv
3. Kwl m¤cmvib wefv‡Mi KgKZv
4. eb wefv‡Mi KgKZv
5. grm wefv‡Mi KgKZv
6. cïcvjb wefv‡Mi KgKZv
7. Ab¨vb¨ (wbw`ó Ki“b) .....

Q. cwk¶‡Y wK wK DcKiY e¨envi Kiv n‡qwQj? .....

.....

R. cKí n‡Z †gvU KZRb‡K Ges KZ¸‡jv e¨vP‡K cwk¶Y †`qv n‡q‡Q?

1. †gvU cwk¶Yv_xi msL¨vt .....Rb
2. †gvU e¨vPt .....wU
3. cwZ e¨v‡P KZRb‡K cwk¶Y †`qv n‡q‡Qt .....Rb

S. cwk¶K‡`i Ávb, `¶Zv I Dc¯vcbv †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

T. cwk¶‡Yi gvb †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

U. cwk¶Y jä Ávb I `¶Zv†K cwk¶Yv_xiv wKfv‡e Kv‡R jwM‡q‡Q? .....

.....

V. cwk¶‡Y †Kvb m¤§vbx fvZv wQj wK? 1. n¨v 2. bv 3. Rwbbv

W. n¨v n‡j, cwk¶Yv_x‡`i: .....UvKv (``wbK) cwk¶K‡`i: .....UvKv (cwZ N›Uvq)

X. cwk¶Yv_x‡`i wbevP‡bi ‡¶‡Î wK wK welq we‡ePbv Kiv n‡qwQj? .....

.....

.....

37. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq Avcwb †Kvb wel‡q cwk¶Y †c‡qwQ‡jb wK? 1. n¨v 2. bv

K. n¨v n‡j, wK wK wel‡qi Dci cwk¶Y †c‡qwQ‡jb?

wel‡qi bvg	‡gqv` (w`b/gvm)

L. GB cK‡íi cwk¶Y †_‡K †h me Ávb I `¶Zv ARb K‡i‡Qb Zv Avcbvi mswkó Kv‡R wKfv‡e mnvqZv Ki‡Q?

.....

.....

‡mKkb 3t KwI welqK Z_¨

38. Mfxi bjKc GjvKvq †mPbvjv wbgv‡bi d‡j KwI †¶‡Î Lv`¨ k‡m¨i Drcv`b †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, cwZ weNvq wK cwigvb †e‡o‡Q?

c‡e t cwZ weNvq .....gY n‡Zv

eZgv‡b t cwZ weNvq .....gY nq

L. wK ai‡bi Lv`¨ k‡m¨i Drcv`b †e‡o‡Q? .....

.....

.....

M. †Kvb Rv‡Zi Lv`¨ k‡m¨i Drcv`b †e‡o‡Q?

1. D"P djbkxj RvZ 2. ¯vbxq RvZ 3. GKB iKg Av‡Q 4. Ab¨vb¨ (wbw`ó Ki"b) .....

39. cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b KwI †¶‡Î k‡m¨i eûgLxKib (GKB Rwg‡Z GKwaK dmj Drcv`b) n‡"Q wK?

1. n¨v 2. bv

K. n¨v n‡j, KqwU dmj Drcw`Z nq? 1. `BwU 2. wZbwU 3. PviwU I Zvi †ekx

L. dm‡ji wbweoZv cKí ev¯evq‡bi c‡e I eZgv‡b KZ? c‡e .....% eZgv‡b.....%

40. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi d‡j ‡m‡Pi AvIZvq KwI Rwgi cwigvb c‡ei Zjbvq wK iKg †e‡o‡Q?
1. m¤úb Rwg †mPf³ 2. A‡aK Rwg †mPf³ 3. Pvi fv‡Mi GKfvM Rwg †mPf³
4. GKB iKg Av‡Q 5. Ab¨vb¨ (wbw`ó Ki“b) .....

41. Avcbvi Kg GjvKvq cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b gwnjv‡iv Kv‡R †ewk AskMnb Ki‡Q wK?
1. n¨v 2. bv

42. c‡ei Zjbvq eZgv‡b cKí GjvKvq Kgms¯v‡bi m‡hvM †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, ci“l I gwnjv‡`i Kgms¯v‡bi m‡hvM †Kvb †¶‡Î †e‡o‡Q ?

e‡i›` cK‡íi Kvi‡b Kgms¯v‡bi m‡hvM †e‡o‡Q		Ab¨vb¨ cK‡íi Kvi‡b Kgms¯v‡bi m‡hvM †e‡o‡Q	
ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb	ci“l‡`i Kgms¯vb	gwnjv‡`i Kgms¯vb
1. KwI KvR	1. KwI KvR	1. KwI KvR	1. KwI KvR
2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl
3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb
4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb
5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR
6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb
7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR
8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR	8. iv¯vNvU/†mZ wbgvY KvR
9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR
10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv
11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR
12. PvKix	12. PvKix	12. PvKix	12. PvKix
13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b) .....

‡mKkb 4t cwi‡ekMZ cfve

43. e‡i›` cK‡íi d‡j cwi‡e‡ki Dci wK ai‡bi BwZevPK/fvj cfve c‡o‡Q? .....

.....

.....

44. e‡i›` †mP cKí ev¯evq‡bi d‡j cwi‡e‡ki Dci †Kvb ¶wZKviK cfve c‡o‡Q wK ? 1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi ¶wZKviK cfve c‡o‡Q ?

1. ‡ivMRxevY I gkv gwQi c‡Kvc †e‡o‡Q 2. Rwgi DeiZv K‡g‡Q 3. g³ cwb‡Z grm¨ Pvl eÜ n‡q‡Q 4. evjvBbvkK e¨envi‡i ew×	5. ivmvqwbK mv‡ii e¨envi ew× 6. Ddmx dm‡ji Pvlvev` †e‡o‡Q 7. Rjve×Zv ew× †c‡q‡Q 8. Ab¨vb¨ (wbw`ó Ki“b) .....

L. GB ¶wZKviK cfve †_‡K g³ nlqvi Dcvq wK? .....

.....

M. e‡i›` †mP cKí ev¯evq‡bi d‡j ¯vbxq Rv‡Zi dm‡ji cwie‡Z D"Pdjbkxj Rv‡Zi dmj Drcv`‡bi d‡j cwi‡e‡ki Dci †Kvb cfve c‡o‡Q wK?

1. n¨v 2. bv

N. e‡i›` †mP cKí ev¯evq‡bi d‡j evjvBbvkK e¨envi‡ii d‡j cwi‡ek `lY †e‡o‡Q wK? 1. n¨v 2. bv

O. e‡i›` †mP cKí ev¯evq‡bi d‡j †QvU gv‡Qi Drcv`b c‡ei Zjbvq eZgv‡b K‡g‡Q wK? 1. n¨v 2. bv

P. e‡i›` †mP cKí ev¯evq‡bi d‡j gv‡Qi ‡iv‡Mi c‡Kvc †e‡o‡Q wK? 1. n¨v 2. bv

Q. e‡i›` †mP cKí ev¯evq‡bi d‡j Rjve×Zv †e‡o‡Q wK? 1. n¨v 2. bv

R. n¨v n‡j, Rjve×Zvi Kvi‡b cwi‡e‡ki Dci wK ai‡bi cfve c‡o‡Q? .....

.....

‡mKkb 5t cK‡íi mdj I `ej w`K mgn

45. e‡i›` ‡mP cKí (Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv) ev¯evq‡bi mdj w`K¸‡jv wK wK? .....

.....

.....

46. e‡i›` †mP cK‡íi `ej w`K¸‡jv wK/¶wZKi cfve wK wK? .....

.....

.....

47. fwel¨‡Z e‡i›` †mP cKí DbZ I KvhKixfv‡e cwiPvjbvi Rb¨ Avcbvi mcwik wK ? .....

.....

.....

ab¨ev` w`‡q mv¶vrKvi MnY †kl Ki“b

diɑ- 3.1

e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí

wbweo Av‡jvPbvi ckgvjv
(RvZxq I †Rjv chv‡qi KgKZv‡`i Rb¨)

fwgKv: Avmmvjvg AvjvBKg| Avgiv ixW bvgK M‡elYv cwZôvb Ges cwiKíbv gšYvj‡qi AvBGgBwW (IMED) Gi c¶ †_‡K gvV chv‡q gj¨vqb Rix‡ci D‡Ï‡k¨ G‡mwQ| Avcbviv Rv‡bb e‡i›` eûgLx Dbqb KZc¶ (BMDA)-KZK 1996-2006 mv‡j evsjv‡`‡ki 3wU †Rjvi 25wU Dc‡Rjvq e‡i›` †mP GjvKv Dbqb I cwk¶Y cKí bv‡g GKwU cK‡íi KvR ev¯evwqZ n‡q‡Q, hvi D‡Ïk¨ wQj AÎ Mfxi bjKc GjvKvq f-Mf¯ cvBc/ cvKv †mPbvjv wbgvY K‡i cwbi AcPq †iv‡ai gva¨‡g †mP GjvKv ew×i cvkvcwk GjvKvq `wi` I wcwQ‡q _vKv Rb‡Mwô‡K AvawbK Pvlev‡`i Kjv †Kškj I DbZ Rxeb e¨e¯vi mv‡_ cwiPq NwU‡q Zv‡`i Av_-mvgwRK Ae¯vi Dbqb Kiv| eZgvb Rix‡ci D‡Ïk¨ n‡"Q f-Mf¯ cvBc/ cvKv †mPbvjv wbgv‡bi Ae¯v, †m‡Pi cwb mieiv‡ni AMMwZ, e¨envi, cwbi AcPq †iva, AvawbK chw³ c‡qv‡Mi gva¨‡g dmj Drcv`b I Gi gva¨‡g Av_-mvgwRK Ae¯vi Dbqb KZUK n‡q‡Q Zv gj¨vqb Kiv|

G cm‡½ Avcwb Avcbvi gj¨evb e³e¨ c`v‡bi gva¨‡g GB M‡elYvq Ae`vb ivL‡Z cv‡ib| Avcbvi AskMnY m¤úYfv‡e Avcbvi Dci wbfi Ki‡Q| Avcbvi gZvgZ ïagvÎ M‡elYvi Kv‡R e¨eüZ n‡e Ges Avcbvi †`qv Z_¨ m¤úY ‡Mvcb ivLv n‡e| Avcbvi AbgwZ †c‡j Awg mv¶vrKvi ï‘i Ki‡Z cwi|

wefvM :	†KvWbs : .....
‡Rjv :	†KvWbs : .....

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mv¶vrKvi MnbKvixi bvg :	mv¶vrKvi Mn‡bi ZwiL: .....
mcvifvBRv‡ii bvg :	ZwiL: .....
mv¶vrKvi Mnb: ï‘i mgq :	‡kl mgq: .....

B›Uvi wfDqvi‡`i Rb¨ wb‡`kbvt B›Uvi wfDqvi mv¶vrKvi ï‘i Av‡M †_‡KB DËi`vZv‡K ckgvjvq D‡jwLZ Óc‡e Ges eZgv‡b Ô mg‡qi e¨vL¨v w`‡q wb‡eb| Ôc‡e Ô Ges ÔeZgv‡biÔ e¨vL¨v n‡jvt 1. Ôc‡e Ô A_vr wbw`ó GjvKvq e‡i›` cKí ev¯evq‡bi KvR †kl nIqvi c‡e A_vr mv¶vrKvi Mn‡bi ZwiL n‡Z Kgc‡¶ 5 eQi c‡ei mgq Ges 2. ÔeZgvbÔ ej‡Z mv¶vrKvi Mn‡bi ZwiL n‡Z MZ 6 gvm †_‡K 12 gv‡mi GKUv Mo mgq| mg‡qi GB wn‡m‡e Óc‡e Ges eZgvbÓ mg‡qi Z_¨ Avb‡Z n‡e|

1. bvg : ..... †dvb bv¤vi: .....

2. eqm: ..... eQi

3. wk¶vMZ †hvM¨Zv: .....

4. c`ex: .....

5. KgGjvKv: .....

6. Avcwb G KgGjvKvq KZw`b a‡i wb‡qwRZ Av‡Qb? .....eQi ..... gvm

7. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi Kv‡R Avcwb wK RwoZ w Q‡jb? 1. n¨v 2. bv

K. n¨v n‡j, D³ cK‡í Avcwb wK `wqZ cvjb K‡i‡Qb? .....
.....

.....

‡mKkb 1t e‡i›` †mP cKí m¤úwKZ Z_¨

8. j¶¨gvÎv Abhvqx D³ cK‡íi KvR mwVKfv‡e ev¯ewqZ n‡q‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, wK wK Kvi‡Y ev¯ewqZ nqwb? .....
.....

9. cK‡íi KvR eivÏKZ A‡_ m¤úb n‡q‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. bv n‡j, †Kb ‡kl nqwb? .....

.....

10. cKí ev¯evqbKvjxb mg‡q cK‡íi KvR m‡iRwg‡b cwi`kb/Z`viwK Kiv n‡qwQj wK?

1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e Kiv n‡qwQj? .....

.....

11. e‡i›` cKí ev¯evq‡b ¯vbxq RbM‡Yi AskMnY †Kgb wQj? .....

.....

12. cKí GjvKvq ‡m‡Pi cwb e›Ub I mieiv‡ni `wqZ †K cvjb K‡ib?.....

13. e‡i›` cK‡íi AvIZvq ¯wcZ Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv i¶Yv‡e¶‡Yi `wqZ †K ev Kviv cvjb K‡ib?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki“b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgw U 5. Ab¨vb¨ (wbw`ó Ki“b) .....

14. ev¯ewqZ cKí mwVKfv‡e i¶Yv‡e¶Y Kiv nq wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, wKfv‡e? .....

.....

15. i¶Yv‡e¶Y Kv‡R A‡_i ms¯vb Av‡Q wK? 1. n¨v 2. bv 3. Rwbbv

K. n¨v n‡j, G Kv‡R A‡_i ms¯vb h‡_ó wK? 1. n¨v 2. bv 3. Rwbbv

L. GB i¶Yv‡e¶Y Kv‡R A‡_i Drm wK? .....

16. cK‡íi eivÏKZ e¨q KZ wQj? 1. .....UvKv 2. Rwbbv

17. cK‡íi †gvU e¨q KZ n‡q‡Q? 1. .....UvKv 2. Rwbbv

18. e‡i›` f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq eZgv‡b cwbi AcPq K‡g‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, cwbi AcPq KZfvM K‡g‡Q ev †iva n‡q‡Q?

c‡e t .....% n‡Zv	eZgv‡b t .....% nq

19. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq eZgv‡b weNv cwZ †mP LiP K‡g‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, KZ K‡g‡Q?

c‡e t .....UvKv wQj (cwZ weNvq)	eZgv‡b t .....UvKv n‡q‡Q (cwZ weNvq)

20. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi d‡j Mfxi bjK‡ci KgvÛ GjvKvq Kwl Rwgi kZKiv KZfvM †m‡Pi AvIZvq G‡m‡Q?

c‡e t 1. .....% Rwg wQj 2. Rwbbv	eZgv‡b t 1. .....% Rwg n‡q‡Q 2. Rwbbv

21. cK‡íi Mfxi bjK‡ci mvnv‡h¨ cwb D‡Ëvjb I f-Mf¯ cvBc/cvKv †mPbvjvi gva¨‡g cwb mieivn-Gi †¶‡Î wK wK mgm¨v nq?

.....

.....

K. wKfv‡e mgm¨vi mgvavb Kiv nq? .....

.....

22. e‡i›` †mP cKí ev¯evq‡bi gva¨‡g Rbmvavi‡Yi Av_-mvgwRK Ae¯v I Rxebavi‡Yi gvb`Û DbZ n‡q‡Q e‡j Avcwb g‡b K‡ib wK? 1. n¨v 2. bv

K. n¨v n‡j, wKfv‡e? .....

.....

L. bv n‡j, †Kb? .....

.....

‡mKkb 2t cwk¶Y welqK gj¨vqb

23. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq wK ai‡bi, KZRb‡K, wK wel‡q I KZw`‡bi cwk¶Y †`lqv n‡qwQj?

K. cwk¶‡Yi aiY	L. KZRb‡K cwk¶Y †`lqv n‡qwQj? (msL¨v)	M. cwk¶‡Yi welqe¯wK wK wQj?	N. KZw`‡bi cwk¶Y †`lqv n‡qwQj? (w`b)
1. Av`k KlK			
2. bjKc Acv‡iUi/ ‡Wbg¨vb/Kcb wWjvi			
3. ‡gKwbK mnKvix			
4. ebvqb/bvmvix Kgx			
5. grm¨Pvlx			
6. Kwl hvšxKviK			
7. Ab¨vb¨ (wbw`ó Ki“b)			

O. †Kvb †Kvb ¯v‡b cwk¶Y †`lqv n‡qwQj? .....

P. cwk¶K/wi‡mvm cv‡mv‡bj wn‡m‡e †Kvb ms¯vi KgKZvMY cwk¶Y w`‡q‡Qb?

1. e‡i›` eûgLx Dbqb KZc‡¶i (weGgwWG) cwk¶K
2. †mP wefv‡Mi KgKZv
3. Kwl m¤cmvib wefv‡Mi KgKZv
4. eb wefv‡Mi KgKZv
5. grm wefv‡Mi KgKZv
6. cïcvjb wefv‡Mi KgKZv
7. Ab¨vb¨ (wbw`ó Ki“b) .....

Q. cwk¶‡Y wK wK DcKiY e¨envi Kiv n‡qwQj? .....

.....

R. cKí n‡Z †gvU KZRb‡K Ges KZ¸‡jv e¨vP‡K cwk¶Y †`qv n‡q‡Q?

1. †gvU cwk¶Yv_xi msL¨vt .....Rb
2. †gvU e¨vPt .....wU
3. cwZ e¨v‡P KZRb‡K cwk¶Y †`qv n‡q‡Qt .....Rb

S. cwk¶K‡`i Ávb, `¶Zv I Dc¯vcbv †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

T. cwk¶‡Yi gvb †Kgb wQj? 1. Le fvj 2. fvj 3. †gvUvgwU 4. Lvivc 5. Le Lvivc

U. cwk¶Y jä Ávb I `¶Zv†K cwk¶Yv_xiv wKfv‡e Kv‡R jwM‡q‡Q? .....

.....

V. cwk¶‡Y †Kvb m¤§vbx fvZv wQj wK? 1. n¨v 2. bv 3. Rwbbv

W. n¨v n‡j, cwk¶Yv_x‡`i: .....UvKv (``wbK) cwk¶K‡`i: .....UvKv (cwZ Kvm)

X. cwk¶Yv_x‡`i wbevP‡bi ‡¶‡Î wK welq we‡ePbv Kiv n‡qwQj? .....

.....

24. e‡i›` †mP GjvKv Dbqb I cwk¶Y cK‡íi AvIZvq Avcwb †Kvb cwk¶Y †c‡qwQ‡jb wK? 1. n¨v 2. bv

K. n¨v n‡j, GB cK‡íi cwk¶Y †_‡K †h me Ávb I `¶Zv ARb K‡i‡Qb Zv Avcbvi msMÖnK Kv‡R wKfv‡e mnvqZv Ki‡Q?

.....

.....

25. GB cK‡íi AvIZvq RvZxq I †Rjv chv‡q cwk¶Y †`qv n‡qwQj wK? 1. n¨v 2. bv

K. n¨v n‡j, RvZxq I †Rjv chv‡q KZRb‡K cwk¶Y †`qv n‡qwQj?

chvq	KZRb †`evi K_v wQj?	KZRb‡K †`qv n‡qwQj?
K. RvZxq chv‡qi KgKZve›`	.....Rb	.....Rb
L. ‡Rjv chv‡q	.....Rb	.....Rb

26. e‡i›` cKí ev¯evq‡bi †¶‡Î ‡Kvb mgm¨v n‡q _vK‡j wK ai‡bi mgm¨v n‡qwQj? .....

.....

.....

K. wKfv‡e mgm¨vi mgvavb Kiv n‡qwQj? .....

.....

.....

‡mKkb 3t KwI welqK Z_¨

27. e‡i›` cKí ev¯evq‡bi d‡j KwI †¶‡Î Lv`¨ k‡m¨i Drcv`b †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, cwZ weNvq wK cwigvb †e‡o‡Q?

c‡e t cwZ weNvq .....gY n‡Zv

eZgv‡b t cwZ weNvq .....gY nq

L. wK ai‡bi Lv`¨ k‡m¨i Drcv`b †e‡o‡Q? .....

.....

M. dm‡ji wbweoZv cKí ev¯evq‡bi c‡e I eZgv‡b KZ? c‡e .....% eZgv‡b.....%

28. cKí ev¯evq‡bi d‡j c‡ei Zjbvq eZgv‡b gwnjv‡iv Kv‡R †ewk AskMnb Ki‡Q wK? 1. n¨v 2. bv

29. c‡ei Zjbvq eZgv‡b cKí GjvKvq Kgms¯v‡bi m‡hvM †e‡o‡Q wK? 1. n¨v 2. bv

K. n¨v n‡j, ci“l I gwnjv‡`i Kgms¯—vbi m‡hvM †Kvb †¶‡Î †e‡o‡Q ?

e‡i›` cK‡íi Kvi‡Y Kgms¯—vbi m‡hvM †e‡o‡Q		Ab¨vb¨ cK‡íi Kvi‡Y Kgms¯—vbi m‡hvM †e‡o‡Q	
ci“l‡`i Kgms¯—vb	gwnjv‡`i Kgms¯—vb	ci“l‡`i Kgms¯—vb	gwnjv‡`i Kgms¯—vb
1. KwI KvR	1. KwI KvR	1. KwI KvR	1. KwI KvR
2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl	2. grm¨ Pvl
3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb	3. Mi“/QvMjcvjb
4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb	4. nvm/giMx cvjb
5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR	5. e¶‡ivcb (ebvqb) Gi KvR
6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb	6. kvK-mewRi evMvb
7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR	7. gwU Lbb KvR
8. iv¯—vNvU/†mZ wbgvY KvR	8. iv¯—vNvU/†mZ wbgvY KvR	8. iv¯—vNvU/†mZ wbgvY KvR	8. iv¯—vNvU/†mZ wbgvY KvR
9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR	9. KwUi wk‡íi KvR
10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv	10. ¶` e¨emv
11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR	11. KjKviLvbvi KvR
12. PvKix	12. PvKix	12. PvKix	12. PvKix
13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b)	13. Ab¨vb¨ (wbw`ó Ki“b) .....

‡mKkb 4t cwi‡ekMZ cfve

30. e‡i›` cK‡íi d‡j cwi‡e‡ki Dci wK ai‡bi BwZevPK/fvj cfve c‡o‡Q? .....

.....

31. e‡i›` †mP cKí ev¯—evq‡bi d‡j cwi‡e‡ki Dci †Kvb ¶wZKviK cfve c‡o‡Q wK ? 1. n¨v 2. bv

K. n¨v n‡j, wK ai‡bi ¶wZKviK cfve c‡o‡Q ?

1. ‡ivM RxevY I gkv gwQi c‡Kvc †e‡o‡Q	5. ivmvqwbK mv‡ii e¨envi ew×
2. Rwgi DeiZv K‡g‡Q	6. Ddmx dm‡ji Pvlvev` †e‡o‡Q
3. g³ cwb‡Z grm¨ Pvl eÜ n‡q‡Q	7. Rjve×Zv ew× †c‡q‡Q
4. evjvBbvk‡Ki e¨eni ew×	8. Ab¨vb¨ (wbw`ó Ki“b) .....

L. GB ¶wZKviK cfve †_‡K g³ nIqvi Dcvq wK? .....

.....

‡mKkb 5t cK‡íi mdj I `ej w`K mgn

32. e‡i›` ‡mP cKí (Mfxi bjKc, f-Mf¯— cvBc I cvKv †mPbvjv) ev¯—evq‡bi mdj w`K¸‡jv wK wK? .....

.....

33. e‡i›` †mP cK‡íi `ej w`K¸‡jv wK/¶wZKi cfve wK wK? .....

.....

34. fwel¨‡Z e‡i›` †mP cKí DbZ I KvhKixfv‡e cwiPvjbvi Rb¨ Avcbvi mcwik wK? .....

.....

ab¨ev` w`‡q mv¶vrKvi MnY †kl Ki“b

dig-4

e‡i›` †mP Gjv Kv Dbqb I cwk¶Y cKí

‡mPbvjv (f-Mf¯ cvBc/cvKv bvjv) cwi`kb I chv‡jvPbv wb‡`wkKv
(Checklist for Observation & Physical Verification of Water Channel/Water Distribution System)

Mvg chv‡q Mfxi bjKc/‡mPbvjv (f-Mf¯ cvBc I cvKv/bvjv) cwi`kb

ID: Mfxi bjKc ☐☐☐☐ **ID:** f-Mf¯ cvBc bvjv ☐☐☐☐ **ID:** cvKv ‡mPbvjv ☐☐☐☐

wefvM :..... ‡KvW bs:.....	†Rjv:..... †KvW bs:.....
Dc‡Rjv:..... †KvW bs:.....	BDwbqb:..... †KvW bs:.....
Mvg: ..... †KvW bs:.....	‡jv‡Kkb: .....
bjKc Acv‡iU‡ii bvg:	c`ex: .....

ch‡e¶YKvixi bvg: ..... ZwiL: .....

Z_¨c`vbKvixi bvg, c`ex I wVKvbv: .....

---

m‡iRwg‡b cwi`kb K‡i Ges cKí mswkó e¨w³, †Wbg¨vb, bjKc Acv‡iUi, †Kqvi‡UKvi I e¨envi Kvix‡`i wRÁvmv K‡i bx‡Pi Z_¨¸‡jv msMn K‡i wjwce× Ki‡Z n‡e| cwZwU Mv‡g GKwU Mfxi bjK‡ci AvIZvq f-Mf¯ cvBc/cvKv ‡mPbvjv cwi`kb I chv‡jvPbv Ki‡Z n‡e|

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1. Mfxi bjKcwUi (DTW) b¤i I †jv‡Kkb: .....

.....

2. Mfxi bjKcwU Pvj Ae¯vq i‡q‡Q wKbv: 1. n¨v 2. bv

3. Mfxi bjKcwUi DrmgL t_‡K †Kvb ai‡bi bvjv ï i“ n‡q‡Q Ges †mUv KZ wgUvi chš?

   1. f-Mf¯ cvBc †mPbvjv: .....wgUvi 2. cvKv †mPbvjv: .....wgUvi

4. wbw`ó Mfxi bjKcwUi AvIZvq ‡mPbvjvi KvR K‡e ï i“ n‡qwQj?

   1. f-Mf¯ cvB‡ci †mPbvjv: .....(gvm I eQi) 2. cvKv †mPbvjv:.....(gvm I eQi)

5. ‡mPbvjvi KvR K‡e ‡kl n‡qwQj?

   1. f-Mf¯ cvB‡ci †mPbvjv: .....(gvm I eQi) 2. cvKv †mPbvjv:.....(gvm I eQi)

6. ‡mPbvjvi Rb¨ eivÏKZ A_ KZ wQj?

1. f-Mf¯ cvBc †mPbvjv: .....(UvKv) 2. cvKv †mPbvjv: .....(UvKv)

7. ‡mPbvjvi Rb¨ †gvU e¨q KZ n‡qwQj?

1. f-Mf¯ cvBc †mPbvjv: .....(UvKv) 2. cvKv †mPbvjv: .....(UvKv)

8. f-Mf¯ cvBc ‡mPbvjvi cwigvc

wWRvBb Abmv‡i j¶¨gvÎv	ev¯‡e wbwgZ n‡q‡Q
‰`N¨: .....wgUvi	‰`N¨: .....wgUvi
c¯: .....wgUvi	c¯: .....wgUvi
D”PZv: .....wgUvi	D”PZv: .....wgUvi

9. cvKv ‡mPbvjvi cwigvc

wWRvBb Abmv‡i j¶¨gvÎv	ev¯‡e wbwgZ n‡q‡Q
‰`N¨: .....wgUvi	‰`N¨: .....wgUvi
c¯: .....wgUvi	c¯: .....wgUvi
D”PZv: .....wgUvi	D”PZv: .....wgUvi

10. f-Mf¯ cvB‡ci ‡mPbvjvi eZgvb Ae¯v

eZgvb Ae¯v	f-Mf¯ cvBc ‡mPbvjvi eZgvb Ae¯v ch‡e¶Y K‡i we¯wiZ gše¨ wjLb (†Kvb wQ`/dvUv/fv½v Av‡Q wKbv, cwb wVKgZ ‡h‡Z cv‡i wKbv, bv †M‡j †Kb cv‡ibv BZ¨w`)
1. Le fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q)	

11. cvKv ‡mPbvjvi eZgvb Ae¯v

eZgvb Ae¯v	‡mPbvjvi eZgvb Ae¯v ch‡e¶Y K‡i we¯wiZ gše¨ wjLb (†Kvb wQ`/dvUv/fv½v Av‡Q wKbv , cwb wVKgZ ‡h‡Z cv‡i wKbv, bv †M‡j †Kb cv‡ibv BZ¨w`)
1. Le fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 2. m‡švlRbK/fvj (wQ`/dvUv/fv½v BZ¨w` bvB) 3. Aí Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q) 4. Le Lvivc (wQ`/dvUv/fv½v BZ¨w` Av‡Q)	

12. ‡mPbvjvi (f-Mf¯ cvBc/cvKv) wbgv‡Y †Kvb Î“wU i‡q‡Q wKbv? 1. n¨v 2. bv

K. n¨v n‡j, wK wK Î“wU i‡q‡Q:

Î“wU	f-Mf¯ cvBc ‡mPbvjv	cvKv ‡mPbvjv
1. wWRvBb Abhvqx ev¯ewqZ nqwb		
2. Ab¨vb¨ (wbw`ó Ki“b)		

13. †mPbvjv (f-Mf¯ cvBc/cvKv) t_‡K chvß cwigvY †m‡Pi cwb cvlqv hvq wKbv? 1. n¨v 2. bv

K. bv n‡j, eQ‡ii †Kvb mg‡q Ges †Kb †m‡Pi cwb cvlqv hvq bv/Afve nq:

‡mPbvjv	K. eQ‡ii †Kvb †Kvb mg‡q †m‡Pi cwb cvlqv hvq bv?	L. †Kb cvlqv hvq bv/Afve nq?
f-Mf¯ cvBc ‡mPbvjvq		
cvKv ‡mPbvjvq		

14. f-Mf¯ cvBc/cvKv †mPbvjvi cwb mweav‡fvMxiv mwVKfv‡e †mP Kv‡h e¨envi Ki‡Z cvi‡Q wKbv? 1. n¨v 2. bv

15. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq cwbi AcPq †iva n‡q‡Q wKbv? 1. n¨v 2. bv

16. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j c‡ei Zjbvq weNv cwZ †mP LiP K‡g‡Q wKbv? 1. n¨v 2. bv

17. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j †mP mweav cvlqvq c‡ei Zjbvq eZgv‡b GjvKvq eQie¨vcx wewfb dmj Drcv`b n‡”Q wKbv?
1. n¨v 2. bv

18. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡Yi d‡j †mP mweav cvlqvq c‡ei Zjbvq eZgv‡b Lv`¨ Drcv`b ew× †c‡q‡Q wKbv?
1. n¨v 2. bv

19. f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi d‡j Mfxi bjK‡ci KgvÛ Gwiqvq †m‡Pi cwbi Pwn`v ciY n‡q‡Q wK?
1. n¨v 2. bv

K. bv n‡j, Pwn`v ciY bv nlqvi Kvib wK?

.....

.....

20. Mfxi bjKc GjvKvq f-Mf¯ cvBc/cvKv †mPbvjv wbgv‡bi gva¨‡g †mP mweav _vKvi d‡j c‡ei Zjbvq eZgv‡b GjvKvi †jvKRb wK wK m‡hvM mweav †fvM Ki‡Q?

.....

.....

Mfxi bjKc **(DTW)**

21. Mfxi bjKcwU ¯vc‡bi mgq (gvm I eQi): .....

22. Mfxi bjKcwU e¨envi ïi“i mgq (gvm I eQi): .....

23. Mfxi bjK‡ci mv‡_ Uv Iqvi Kiv n‡q‡Q wKbv? 1. n¨v 2. bv

K. n¨v n‡j, Uv Iqvi-Gi eZgvb Ae¯vi weeiYt .....

.....

.....

24. Mfxi bjK‡ci wWmPvR: cwZ wgwb‡U KZ wKD‡mK: .....

25. mn‡RB Ges h‡_ó cwigvY cwb D‡V wKbv: 1. n¨v 2. bv

26. cwb bv DV‡j KviY wK: 1. hš¿s‡ki Amwea v 2. ¯vcbvi Amwea v 3. Ab¨vb¨ (wbw`ó Ki“b) .....

27. bjKcwU‡Z mKj †gŠm‡g cwb _v‡K wKbv: 1. n¨v 2. bv

K. bv n‡j, †Kvb †gŠm‡g, KZw`b Ges wK Kvi‡Y cwb _v‡K bv:

1. †Kvb †gŠm‡g..... 2. KZw`b: .....

3. wK Kvi‡Y: .....

28. Mfxi bjKc, †mPbvjvi (f-Mf¯ cvBc/cvKv bvjv) †givgZ I i¶Yv‡e¶Y Kiv nq wK? 1. n¨v 2. bv

K. bv n‡j, †Kb i¶Yv‡e¶Y Kiv nq bv? .....

.....

L. n¨v n‡j, KZw`b ci ci Kiv nq?

1. gwmK 2. 6 gvm Aši 3. GK eQi Aši
4. gv‡S gv‡S/c‡qvRb †gvZv‡eK Kiv nq 5. dmj †gŠm‡gi ï‘i“‡Z

M. Mfxi bjKc/†mPbvjvi †givgZ I i¶Yv‡e¶‡Yi `wqZ †K cvjb K‡i?

1. Mfxi bjKc	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgwu 5. Ab¨vb¨ (wbw`ó Ki“b) .....
2. f-Mf¯ cvBc/ cvKv †mPbvjv	1. BMDA 2. cwb e¨envi Kvixiv 3. †Kqvi‡UKvi 4. w¯‹g Kwgwu 5. Ab¨vb¨ (wbw`ó Ki“b) .....

29. i¶vYv‡e¶Y Kv‡Ri A‡_i ms¯vb wKfv‡e nq?

1. miKvix Znwej †_‡K (weGgwWG) 2. †cŠimfv/BDwbqb cwil‡`i Znwej n‡Z
3. ¯vbxqfv‡e Pv`v msMn I †¯”Qvk‡gi gva¨‡g (mwea v‡fvMx‡`i) 4. w¯‹g Kwgwui gva¨‡g
5. Ab¨vb¨ (wbw`ó Ki“b) .....

30. ‡givg‡Zi Kv‡Ri A‡_i ms¯vb wKfv‡e nq?

1. miKvix Znwej †_‡K (weGgwWG) 2. †cŠimfv/BDwbqb cwil‡`i Znwej n‡Z
3. ¯vbxqfv‡e Pv`v msMn I †¯”Qvk‡gi gva¨‡g (mwea v‡fvMx‡`i) 4. w¯‹g Kwgwui gva¨‡g
5. Ab¨vb¨ (wbw`ó Ki“b) .....

31. ‡Wbg¨vb mwVKfv‡e cwb weZiY K‡i wK? 1. n¨v 2. bv

32. bjKc Acv‡iUi mwVKfv‡e bjKc †`Lv‡kvbv K‡i wK? 1. n¨v 2. bv

33. weGgwWG †_‡K Mfxi bjKc/†mPbvjv (f-Mf¯ cvBc/cvKv bvjv) Z`viwK Kiv nq wKbv? 1. n¨v 2. bv

34. ‡Wbg¨v‡bi cwb mieiv‡ni †¶‡Î wK wK mgm¨v nq? .....

.....

K. mgm¨vi m¤ve¨ mgvavb wK? .....

.....

35. bjKc Acv‡iU‡ii cwiPvjbvi †¶‡Î wK wK mgm¨v nq? .....

.....

K. mgm¨vi m¤ve¨ mgvavb wK? .....

.....

36. DbZ ai‡bi †m‡Pi cwb e¨envwiKvix‡`i g‡a¨ cwb e¨env‡ii mgšq KvR h_vh_ nq wKbv Ges Zv †K, wKfv‡e K‡ib? (MwVZ mgšq KwgwUi gva¨‡g bwK cKí KgKZv‡`i gva¨‡g)

.....

.....

.....

37. cwb e¨envwiKvix‡`i cwb mieivn I cvc¨Zv wel‡q gZvgZ:.....

.....

.....

38. ch‡e¶YKvix m‡iRwg‡b Mfxi bjKc, f-Mf¯ cvBc I cvKv †mPbvjv ch‡e¶Y K‡i Gi mwnK wel‡q gše¨ wjL‡e (Mfxi bjKc, f-Mf¯ cvBc/cvKv †mPbvjwUi eZgvb Ae¯v †Kgb, GwU e¨eüZ n‡"Q wKbv, wK wK Kv‡R e¨eüZ n‡"Q, GjvKvi RbMY GwU †_‡K wKfv‡e jvfevb n‡"Q, Gi fv‡jv I Lvivc w`K¸‡jv wK we¯wiZ fv‡e wjwce× Ki‡e)|

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diɑ-5

e‡i›` †mP Gjv‡Kv Dbqb I cwk¶Y cKí

cwk¶Y ‡m›Uvi ch‡e¶Y I cwi`kb wb‡`wkKv

wefvM :.....	‡KvW bs:.....	†Rjv:.....	†KvW bs:.....
Dc‡Rjv:.....	†KvW bs:.....	BDwbqb:.....	†KvW bs:.....
Mvg:	†KvW bs:.....	‡jv‡Kkb:	
cwk¶Y ‡K‡›`i ‡Kqvi‡UKv‡ii bvg:		c`ex:	

ch‡e¶YKvixi bvg: ..... ZwiL: .....

Z_¨c`vbKvixi bvg, c`ex I wVKvbv: .....

m‡iRwg‡b cwi`kb K‡i Ges cKí mswkó e¨w³ ‡K wRÁvmv K‡i bx‡Pi Z_¨¸‡jv msMn K‡i wjwce× Ki‡Z n‡e|

1. cwk¶Y ‡K›` ¯'vc‡bi eQi: .....
2. cwk¶Y ‡K›` †_‡K cwk¶Y ïi“i eQi: .....
3. cwk¶Y ‡K‡›`i weeiYt
   K. cwk¶Y ‡K‡›`i Rwgi AvqZb: .....kZvsk
   L. cwk¶Y ‡K‡›`i wewìs -Gi AvqZb: ‰`N¨ : .....wgUvi c¯— : ..... wgUvi
   M. wewìs msL¨v: .....wU
   N. K¶ msL¨v: .....wU
4. cKí n‡Z †gvU KZRb‡K Ges KZ¸‡jv e¨vP‡K cwk¶Y ‡K›` †_‡K cwk¶Y †`qv n‡q‡Q?
   1. †gvU cwk¶Yv_xi msL¨vt .....Rb
   2. †gvU e¨vPt .....wU
   3. cwZ e¨v‡P KZRb‡K cwk¶Y †`qv n‡q‡Qt .....Rb
5. ‡Uwbs i“‡gi cwigvc

wWRvBb Abmv‡i j¶¨gvÎv	ev¯—‡e wbwgZ	eZgvb Ae¯'v †KvWt 1. fv‡jv 2. AvswkK ¶wZM¯— 3. ¶wZM¯—	ch‡e¶‡Yi djvdj/gše¨
‰`N¨: ..... wgUvi	‰`N¨: ..... wgUvi		
c¯—: ..... wgUvi	c¯—: ..... wgUvi		
D”PZv: .....wgUvi	D”PZv: ..... wgUvi		

6. ‡Uwbs i“‡gi KvVv‡gvt

K. Qv`t 1. KswµU/cvKv 2. wUb 3. KvV 4. Ab¨vb¨ (wbw`ó Ki“b) .....

L. †`qvjt 1. KswµU/cvKv 2. wUb 3. KvV 4. Ab¨vb¨ (wbw`ó Ki“b) .....

M. †g‡St 1. KswµU/cvKv 2. gwU 3. KvV 4. Ab¨vb¨ (wbw`ó Ki“b) .....

7. **Physical Facilities**

Facilities	KZ¸‡jv Av‡Q			KZ¸‡jv Kvh¶g/mPj/fvj		
	1. n¨v	2. bv	msL¨v	1. n¨v	2. bv	msL¨v
1. cwk¶Y ‡K‡›` Kvm i“g Av‡Q						
2. cwk¶Yv_x‡`i _vKvi e¨e¯v (evm¯vb) Av‡Q						
3. †Pqvi						
4. †Uwej						
5. wmwjs d¨vb						
6. ‡Uwej d¨vb						
7. ó¨vÛ d¨vb						
8. we`¨r						
9. ‡Rbv‡iUi						
10. Kw¤úDUvi						
11. d‡Uvó¨vU †gwkb						
12. OHP						
13. gwë wgwWqv/j¨vcUc						
14. Iqvmv KZK cwb mieivn						
15. wUDeI‡qj (Av‡mwbK g³)						
16. ev_i“g (IqvUvi mxj mn wis I ¯¨v‡ei ‰Zix)						
17. ev_i“g (wis I ¯¨v‡ei ‰Zix)						
18. ‡Uwj‡dvb						
19. wdR						
20. Gwm						
21. ‡Uwjwfkb						
22. Nwo						
23. hvZvqv‡Zi Rb¨ hvbevnb						
24. Ab¨vb¨ (wbw`ó Ki“b)						

8. GKUv i“‡g KZRb cwk¶bv_x emvi e¨e¯v Av‡Q? .....Rb

9. ‡Uwbs i“‡gi Av‡jv evZvm PjvP‡ji Ae¯v †Kgb? 1. fvj 2. ‡gvUvgwU 3. Lvivc

10. ‡Uwbs i“‡g chvß Rvbvjv-`iRv Av‡Q wKbv? Rvbvjv: .....msL¨v `iRv: .....msL¨v

11. cwk¶Y ‡K‡›` cwk¶Y DcKi‡Yi mieivn †Kgb? 1. chvß 2. Achvß

12. ‡Uwbs i“‡g wK wK DcKiY Av‡Q ?

1. evK †evW	6. wdc PvU
2. †nvqvBU †evW	7. ‡cvóvi
3. gvKvi	8. e¨vbvi
4. PK	9. OHP
5. †cwÝj	10. Ab¨vb¨ (wbw`ó Ki“b) .....

13. cwk¶Y ‡K‡›` we‡bv`‡bi e¨e¯v Av‡Q wKbv, _vK‡j wK ai‡bi e¨e¯v Av‡Q?

.....

.....

.....

14. cwk¶Y ‡K‡›`i eZgvb Aešv ch‡e¶Yt

welq	cwi®vi cwi"QbZvi Ae¯v (Cleanliness)			wbgv‡bi/†givgZi Ae¯v (Construction/Repairing Status)		
	‡KvWt	1. cwi®vi	2. ‡gvUvgwU cwi®vi 3. Acwi®vi	‡KvWt	1. cwi®vi	2. ‡gvUvgwU cwi®vi 3. Acwi®vi
1. ‡g‡S						
2. ‡`qvj						
3. Qv`						
4. dwbPvi/Avmevc Î						
5. ev_i"g						
6. mweK cwi‡ek						

15. ch‡e¶YKvix m‡iRwg‡b cwk¶Y ‡K‡›`i eZgvb Aešv ch‡e¶Y K‡i Gi mweK wel‡q gše¨ wjL‡e (cwk¶Y ‡K‡›`i eZgvb Aešv †Kgb, GwU e¨eüZ n‡"Q wKbv, GjvKvi RbMY GwU †_‡K wKfv‡e jvfevb n‡"Q, Gi fv‡jv I Lvivc w`K¸‡jv wK BZ¨w` we¯wiZ fv‡e wjwce× Ki‡e)|

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diɑ- 5. 1

e‡i›` †mP Gjv Kv Dbqb I cwk¶Y cKí

cwk¶Y Kvhµg gj¨vqb †PKwjó

wefvM :.....	‡Kvw bs:.....	†Rjv:.....	†Kvw bs:.....
Dc‡Rjv:.....	†Kvw bs:.....	BDwbqb:.....	†Kvw bs:.....
Mvg:	†Kvw bs:.....	‡jv‡Kkb:	

ch‡e¶YKvixi bvg: ..... Zwi L: .....

Z_¨c`vbKvixi bvg, c`ex I wVKvbv: .....

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m‡iRwg‡b cwi`kb K‡i Ges cKí mswkó e¨w³ ‡K wRÁvmv K‡i bx‡Pi Z_¨¸‡jv msMn K‡i wjwce× Ki‡Z n‡e|

---

cwk¶Y ‡K‡›`i bvgt .....

cwi`k‡bi Zwi L I mgqt mgq..... Zwi L:.....

1. ‡gvU KZwU e¨vP‡K cwk¶Y †`lqv n‡q‡Qt .....wU
2. cwZ e¨v‡P KZRb‡K cwk¶Y †`qv n‡q‡Qt
   ci“l.....msL¨v gwnjv.....msL¨v ‡gvU.....msL¨v
3. cwZ e¨v‡P wi‡mvm cv‡mv‡bj/cwk¶‡Ki msL¨v t ci“l.....msL¨v gwnjv.....msL¨v ‡gvU.....msL¨v
4. †gvU cwk¶Yv_xi msL¨vt ci“l.....msL¨v gwnjv.....msL¨v ‡gvU.....msL¨v
5. ‡gvU wi‡mvm cv‡mv‡bj/cwk¶‡Ki msL¨v t ci“l.....msL¨v gwnjv.....msL¨v ‡gvU.....msL¨v
6. KZw`b †gqv`x cwk¶Y wQjt .....w`b
7. ‡Uwbs ïi“ Ges †kl nIqvi mgq wK wQjt ïi“i mgq: ..... ‡kl mgq:.....
8. ‡Uwbs G cwk¶bv_xi weeiYt .....

.....

9. ‡Uwbs- G †K †K cwk¶Y c`vb Ki‡Qb? .....
10. Zv‡`i †hvM¨Zv ? .....
11. cwk¶KMY‡K TOT c`vb Kiv n‡q‡Q wK? 1. n¨v 2. bv

K. cwk¶KMY TOT †Kv_vq MnY K‡i‡Qb? .....

L. KZ w`‡bi TOT ‡`Iqv n‡q‡Q? .....w`b

12. cwk¶‡Yi wm‡jev‡m wK wKelq Ašf³ wQj? .....

.....

13. wK KwiK¨jvg ev gwWDj e¨envi Kiv n‡q‡Q? .....

.....

.....

14. cwk¶‡Yi mweavmgn **(Facilities)**

mweavmgn (**Facilities**)	‡KvWt 1. chvß 2. ‡gvUvgwU chvß 3. chvß bq
1. ‡kYx K¶	
2. Av‡jv evZv‡mi Ae¯v	
3. emvi e¨e¯v	
4. Avc¨vqY e¨e¯v	
	‡KvWt 1. Av‡Q 2. bvB
5. ‰e`¨wZK cvLv	
6. kxZvZc wbqšb e¨e¯v (Gwm)	
7. we‡bv`b e¨e¯v	
8. wbivc` cwbi e¨e¯v	
9. ev_i“g	
10. cwk¶bv_x‡`i Avevmb e¨e¯v	

15. cwk¶Y c×wZ **(Methodology of the Training)**

cwk¶Y c×wZ	‡KvWt 1. KwiK¨jvg Abhvqx Kiv n‡q‡Q 2. KwiK¨jvg Abhvqx Kiv nqwb 3. G‡Kev‡iB nqwb
1. ‡jKPvi	
2. Av‡jvPbv/gZ wewbgq	
3. M“c Iqvk	
4. ‡ivj †c	
5. Ab¨vb¨ (wbw`ó Ki“b).....	

16. cwk¶Y cwµqv **(Process of Training)**

`¶Zv hvPvB	‡KvWt 1. wbqwgZ 2. wbqwgZ bq
1. bgbv Abkxjb (Model practice)	
2. †PKwj ÷ e¨envi K‡i	
3. nv‡Z Kj‡g cwk¶Y	
4. cwk¶Y ce gj¨vqb	
5. cwk¶Y †k‡l Ávb hvPvB	

17. cwk¶‡b e¨eüZ DcKiYmgn **(Training material)**

cwk¶‡Y e¨eüZ DcKiYmgn	†KvWt 1. n¨v 2. bv	†KvWt 1. chvß 2. chvß bq
1. cwk¶K‡`i eB/wb‡`wkKv/n¨vÛ AvDU		
2. cwk¶Yv_x‡`i eB/wb‡`wkKv/n¨vÛ AvDU		
3. ‡evW		
4. OHP		
5. g‡Wj		
6. LvZv-Kjg		
7. e¨vM		
8. wdc PvU		
9. ‡cvóvi		
10. Ab¨vb¨ miÄvgv`x (wbw`ó Ki“b).....		

18. msi¶Y e¨e¯v **(Record Keeping)**

welq	‡KvWt 1. msi¶Y Kiv n‡q‡Q 2. msi¶Y Kiv nqwb
1. nwRiv LvZv (Attendance register)	
2. Av‡jvPbvi welqe¯wjwce× Kiv	
3. `¶Zv hvPvB Kib wjwce× Kiv	

19. cwk¶Y PjvKvjxb DbœZi gj¨vqb **(Performance evaluation during training)**

cwk¶Y PjvKvjxb DbœZi gj¨vqb	‡KvWt 1. Kiv n‡q‡Q 2. Kiv nqwb
1. cwZw`b gj¨vqb	
2. Povš cix¶vi gva¨‡g gj¨vqb	

20. cwk¶‡Yi mgšq **(Coordination of the training):** 1. fvj 2. ‡gvUvgwU 3. fvj bq

<u>gše¨t</u>

ch‡e¶YKvix cwk¶Y ‡K›` cwi`kb K‡i H †K›` †_‡K cwiPvwjZ/mgvßKZ Training Program gj¨vhb K‡i Gi mwnK wel‡q gše¨ wjL‡eb (Training Program wKfv‡e cwiPvjbv Kiv n‡q‡Q, Gi fv‡jv I Lvivc w`K¸‡jv BZ¨w` we¯wiZ fv‡e wjwce× Ki‡eb)|

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