CIWM Completed Action Research Projects

(2000-2016)

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Background

CIWM conducts action researches by emphasizing irrigation and water management as means of improved agricultural practices for sustainable rural development. Since its inception, it has been continuing action research projects to generate additional employment opportunities in rural areas through irrigation and water management technologies. It has already successfully completed (2001-2016) nine action research projects.

Agriculture in Bangladesh is still dominating our economy in terms of employment, though not in terms of GDP. Agriculture traditionally had been dependent on rainfed irrigation. But with the advent of science and technology and under the pressure of a very fast growing population, modernization of agriculture became inevitable. All options of modernizing agriculture had to be exercised. To supplement the volatile and irregular precipitation causing fluctuation in agricultural yield was identified as one of the major hindrances to the sustainable growth of agricultural output.

So, mechanized irrigation along-with the application of chemical fertilizer in appropriate doses and HYV seeds were introduced. Surface water resource might be the potential means of irrigation to our agriculture but because of it's alternating abundance and scarcity characteristics failed to be a regular and reliable source of irrigation. So, the scientists have no other obvious choice than abstracting sub-surface water for irrigation purpose.

Dr. Akhter Hameed Khan was the first man in this country to introduce mechanized abstraction of sub-surface water where surface water was not available. Both BARD and RDA proceeded in the direction he showed.

Rural Development Academy (RDA), Bogra is a national level training and research institute of rural development established in 1974 under the Ministry of Local Government, Rural Development and Co-operatives. The major objectives of the Academy are to (i) offer training to the personnel of different nation building departments and agencies involved in rural development works as well as to rural women, youth and farmers; (ii) conduct research and action research or pilot experiments in different aspects of rural development; and (iii) offer consultancy services to different national and international agencies as well as NGOs on various rural development issues.

To achieve the objectives, the Academy has been working on a wide range of rural development activities since 1974 with slightly more emphasis on exploring and managing water resources as a means of rural development. Availability of surface water during dry season becomes scarce both for irrigation and human consumption. So the ground water has become increasingly important source of irrigation, human drinking and other purposes. Presently over 70% of irrigation and over 90% of potable water need of the country are met from ground water. In such a backdrop ground water table goes below the suction level of STW and HTW, especially in the dry season due to misuse. This hampers supply of water for irrigation as well as drinking in many places of Bangladesh. The quality of water has been traced to deteriorate with excessive arsenic contamination and iron concentration resulting in human health hazard.

Rural Development Academy (RDA), Bogra has successfully carried out experiments in the field of water resources management and development since 1982, especially, in respect of optimum utilization of scarce water resources and has developed a model of multi-purpose use of DTW. The model includes: (i) partial buried pipe irrigation system; (ii) low and medium cost lined channel; (iii) compacted earthen channel; (iv)

domestic water supply from irrigation well (v) installation of low-cost DTW with water filtration plants etc. In order to replicate these models of exploration and management of water, the academy organized several programs for demonstration and training of the officials of BADC, LGED, DAE and BRDB.

Chronology of RDA's experience in Irrigation and Water Management :

1982

Average command area of a BARD - installed 2 cusec DTW was at best 16 hectare. RDA carried out action research on Command Area Development (CAD) and extended the area coverage by a same capacity DTW upto 67 hectare in village Narhatta of Bogra Sadar Upazila in 1982 for the same crop grown in the same season through the introduction of buried pipe irrigation system. The area coverage was the highest so far achieved in Bangladesh. Further research in CAD in other areas of the district of Bogra projected almost similar success. As a result, use of ground water for such an extended area could be reduced from 8 lakh to 2 lakh litre per hour and power consumption from 80 K. W. to 20 K.W. This helped protect the environmental aspects of ground water resources as well as water quality. This also helped reduce power consumption as well as cost of irrigation per hectare.

1982-1986

Dual use of DTW was experimented during this period and was found feasible. Year-round utilization of DTW for irrigation and drinking purpose was ensured to make it a profitable investment. Per-capita domestic water use was increased manifold, which in turn improved quality of life through better sanitation. In recent times the model has been replicated by different govt. departments/NGOs in the country and also in some CIRDAP countries.

1986-1990

A number of training modules on utilization and management of water resources were developed and quite a good number of officials of BRDB, BADC, DAE, LGED and the water users were trained.

Achievements after 1990

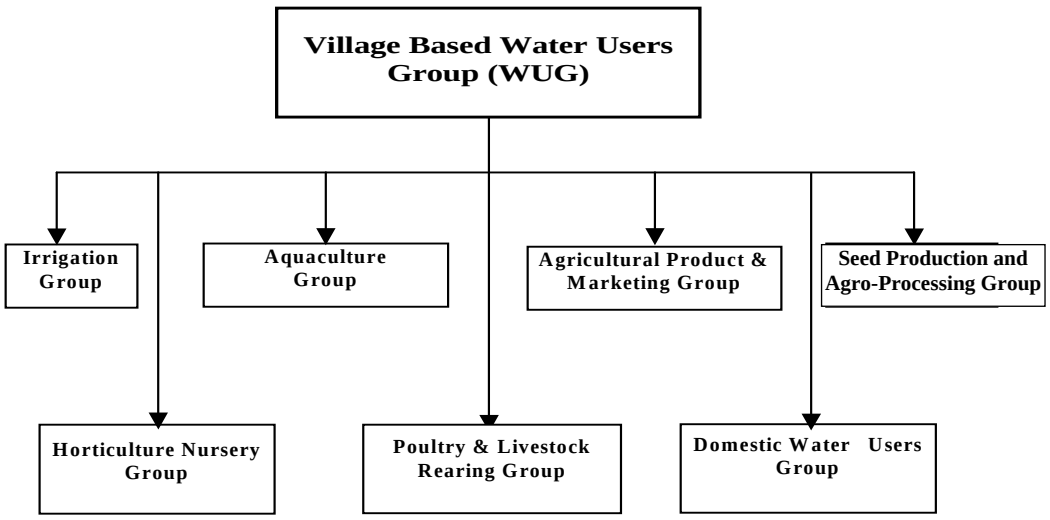
RDA developed Low-Cost DTW Model

Rural Development Academy (RDA), Bogra developed the Low-Cost DTW Model in 1998. This Low-cost DTW has got the superiority over the traditional DTWs, especially in respect of cost and quantum of water supply on regular basis. Total cost of abstracting water by traditional DTWs became high because of selection of bigger size of pump and prime mover (engine/motor) without consideration of the actual demand of water and power consumption. For a traditional DTW of 2-cusec discharge capacity by a 30 hp motor, the annual electric bill is around Tk. 30-35 thousand. Usually the DTWs remain idle during the off-irrigation season. If the power line is not disconnected there will be again a minimum bill for line rent. Ultimately, the operational cost of such a traditional DTW becomes a burden to the users unless the command area is proportionately enhanced. Due to high capital investment and O & M costs as well as complex management system, use of traditional DTW for only seasonal irrigation purpose has not been found economically viable. Keeping the above facts in view, RDA has carried out the experiment for developing the low-cost demand-based DTW having a capacity-range from 10,000 litre/hour to 2,00,000 litre/hour and this has proved successful. It has ensured water supply from the main aquifer by a low-cost demand-specific DTW which is based on economical design and suitable for Bangladesh context.

The RDA DTW Model is demand-based because due consideration is given to calculating the actual demand of water abstraction and to selecting the size of the pump and prime mover (motor) accordingly. Until now the sizes of RDA-developed DTWs vary from 7.5 hp to 30 hp; at the same time discharge capacities of the pumps vary from 10,000 litre/hour to 2,00,000 litre/hour. The RDA-developed DTW is low-cost in the sense that the materials used are locally available, the drilling technique is manual and cost-effective, power consumption is low and the total capital investment is less.

DTW Management

Before installation of DTW in any village/place, finalization of management structure is very important. To finalize the overall management structure, a field inventory is done through a thorough socio-economic survey, which includes among others, identification of owners (NGO/Water Users' Group, etc.), probable site, different purposes of water use and different water users' group. Then on the basis of the socio-economic survey report, a Village Resource Book for the village has been prepared and an MOU has been signed between RDA, Bogra and the NGO/Management Group formed by the users. The MOU includes technical, financial and other terms and conditions for repayment schedule of capital investment.



RDA Credit Operation under the DTW model

As stated earlier there will be a provision of a village-based water users group in each sub-project area. The group members will be provided training at the Academy on different income generating activities. After successful completion of training, they will be provided with RDA credit under seed capital component of the project from the transacting bank. All the credit activities will be operated by the concerned management group under the direct supervision of RDA. The maximum interest rate will be the declaration rate of Bangladesh Bank. The total recovered money will be deposited in a separate account of the Academy and after completion of the project, the Centre for Irrigation and Water Management (CIWM), RDA, Bogra will continue its follow-up the project activities as well as under take new project sites for research/action research on water resources development.

Safe Drinking Water Supply model

In Bangladesh, Hand Tubewells (HTW) are mostly used for abstracting groundwater for drinking purposes. The hand tubewells abstract groundwater usually from shallow aquifer and there is risk of biological and chemical contamination and deterioration of water quality in many places. Very recently, arsenic contamination of groundwater has emerged as a major public health hazard in the country. The contamination was first detected in 1993 when only four tubewells were found polluted with arsenic in

Chapai Nawabganj district in the north-west region of Bangladesh. Subsequently in 1994, for the first time, the Department of Occupational and Environmental Health (DOEH) of the National Institute of Preventive and Social Medicine (NIPSOM), Bangladesh identified eight patients suffering from arsenic toxicity. Initially, it was reported that the arsenic contamination was present in eight western border districts of Bangladesh and about 10 million people were at risk. Until 1997, it has been found that the problem existed in most areas of the country except the south-east hilly region and the Barind tract where arsenic contamination in groundwater has not been detected. It has been reported that about 35 million people are affected by arsenic contaminated groundwater through drinking and other unknown ways (Khan and Ahmad, 1997; Khan et. al, 1997).

How ever, RDA has already developed low-cost arsenic mitigation devices. The quality of water has been brought up to Bangladesh as well as World Health Organization (WHO) Standard. RDA's Irrigation and Water Management Technology has been disseminated at 118 sites over Bangladesh and drawn unique positive sign to upliftment the socio-economic condition as well as the additional income among the project beneficiaries.

- Total area of irrigation coverage by the water extracting means developed by RDA at the sub-project areas is about 3,820 ha.
- Target command area for the next coming year will be about 5,730 ha.
- A total 23,600 households are interconnected under safe water supply system and RDA's target to inter connected about 29,500 households.
- Besides this local people have been received training on their fields of interest and enjoyed RDA credit to undertake the IGA's in action.

Locally employment is being generated. Additional income of the project beneficiaries are being ensured and the trickle down-drop benefits goes to general mass people of project area so, the socio-economic levels at the project areas are uplifted. These activities have been drawn positive sign towards the surrounded areas as well as the other part of the countries. The demand of such type of water resources management projects have been increasing day by day.

Success in Transfer of Irrigation Technology

Irrigation and water management related projects like ITRTT, IMP and TCAD have done a significant achievement in boosting up agricultural production and diversification of crops through improved water distribution system, improvement in the irrigation management programme, construction of appropriate irrigation channel and command area development of an irrigation equipment. Second, the Academy through its Faculty of Irrigation Management (FIM) introduced irrigation management as a multidisciplinary approach covering engineering, agronomical and management aspects as essential components. Over the years, it has also developed five training modules of multidisciplinary approach as a carrier of technology transfer in the field of irrigation management. Apart from imparting training to the officials, it offers training to the project beneficiaries through participatory approach. Third, several appropriate technologies have been devised in the field of irrigation and water management which are worth-mentioning

Community based Biogas Plant Model

RDA, Bogra has conduct action research on better solid waste management through community approached bio-gas plant. Two number of bio-gas plants having capacity of 130m^3 each have been constructed at RDA campus. A total number of 19 households (4 storied building), Guest house, DG's Banglaw have been connected under bio-gas facilities. Moreover a 4.6 KVA generator is being operated using bio-gas and electrified a small portion of RDA demonstration farm. The slurry (fermented cow dung & Kitchen waste) produced from bio-gas plant are processed as organic manure and sold at market in a brand of "Palli Joibo Sar" Rural Organic Manure. The model is one of the most environment friendly cheapest renewable energy resources. It's playing an important role for enhancing the productivity of agricultural land and rural livelihood as well. Academy is also purifying biogas impurities (H_2S; CO_2; moisture) and bottling bio-gas in cylinder for cooking and inject in vehicle as CNG (Compressed Natural Gas). This modern bio-gas technology creates positive response in development of rural poor. Air pollution and carbon emission are drastically reduced. Considering the merits of this approach Bangladesh government has funded RDA to replicate this model at 112 individual locations over the country through ADP allocation for livelihood improvement of the rural Bangladesh.

Two storied agriculture with direct solar powered irrigation

The new innovation of RDA is **"two storied agriculture with direct solar powered irrigation system"** minimizes pressure on national power supply grid. Where rice produce as base crop and cucurbit (bottle gourd) crop as 2nd layer crop. Solar panel placed on top layer generates power for lifting ground water using direct sunshine. Adoption of this system increase cropping intensity from 180% to 360% and even 500% in Bangladesh, accelerates rural development.

Completed Action research project list is appended in **Appendix-A** and project wise details brief and outcome/output are attached herewith an **Appendix-B.**

Appendix-A

Completed Action Research Projects at a Glance

Sl. No.	Name of the project	Sponsor (s)	Duration	Location & coverage
1.	Action Research Project on Multipurpose use of low-cost DTW for long-term post flood rehabilitation **(MUDP)**	GOB	1999-2004	18 sites over country
2.	Socio-Economic Development and Quality of Life Through **Arsenic Free Safe Drinking** Water Supply.	GOB	2001-2006	24 sites over country
3.	Creation of Additional Employment, Increase in Marginal Productivity of Labour in Rural Economic Activities and Poverty Alleviation Through Irrigation and Water Management.	GoB	July 2005 – June 2009	51 sites over country
4.	Action Research Project on Increasing Irrigated Area through transferring -model of Irrigation and Water Management Technology in Southern and **Hill Districts** of Bangladesh.	GoB	July 2006 – June 2010	15 Hill areas of Bangladesh
5.	Action Research Project on Command Area Development using Surface Water for Rural Livelihood Improvement by Replicating RDA Technology (ADP).	GOB	2007 – 2015	45 sites over country
6.	Action Research Project on Poverty Alleviation through Livestock Management and Bio-Gas Bottling	GoB	November 2009 - December 2015	112 sites over country
7.	RDA-Cornell University Collaborative Raised Bed Technology Expansion Project in the Central West Region of Bangladesh	USDA /Cornell University, USA	2010 - 2013	RDA demonstration farm and Bogra, Naogaon, Joypurhat, Sirajgonj
8.	Safe Water Supply, Sanitation and Bio-gas Technology for Rural Livelihood Improvement in Climate Victim People of Bangladesh.	GOB	2011-2014	13 Climate Victim Areas
9.	Action Research Project on Integrated Water Management (IWM)	GOB	2011- 2014	78 sites over country

Appendix-B

Completed Action Research Project Profile

(1) Project brief:

A. Name of the project : **Action Research Project on Multipurpose Use of Low-cost DTW for Long-term Post Flood Rehabilitation**

B. Objectives of the project : The main objective of the project is to introduce multipurpose use of Deep Tube well in the flood prone areas of Bangladesh for changing socio-economic and quality of rural life through command area development for crop production and supplying safe water for household purposes on the basis of RDA-innovated irrigation and domestic water technology. The specific objectives are as follows:

1. To install low-cost demand-based deep tube well according to crops and household water supply.
2. To reduce capital cost of deep tube well introducing local technology specially RDA-innovated low-cost technology.
3. To ensure water for irrigation, safe drinking, acquaculture, nursery, cottage industry etc. from the same source of deep tube well.
4. To protect rural people from water borne diseases and to develop public health through supplying safe water.
5. To encourage private owner for investment in this type of project; and
6. To offer training on different income generating activities for efficient use of deep tube well.

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Duration of the project : 1999-2004

E. Major Activities : Major activities of the project

Training : Providing training to both officials and primary beneficiaries regarding skill development and technology transfer.

Action Research : The major components of the action research activities are as follows :

a. Installation of RDA-developed low-cost DTW.
b. Construction of multipurpose overhead tank.
c. Installation of underground/buried pipe irrigation distribution system.
d. Construction of domestic water supply network.

e. Identification and formation of groups.

f. Distribution and operation of micro credit among the beneficiaries.

As of now, a total of 15 sites have been developed under a sustainable management units model in the field of minor irrigation projects.

Micro credit Activities : Micro credit is another major component of this project. Credit will be disbursed among the group members for initiating different income generating activities like horticulture, nursery, fisheries, small cottage industries, poultry and dairy.

F. Research outcome :

1. The achievements of the training courses are satisfactory.
2. The capital cost of RDA-developed DTW ranges from Tk. 60 thousand to Tk. 3.15 lakh depending on different discharge capacity and depth of the well. At least 30-40% cost could be reduced with the same discharge capacity of DTW.
3. Beneficiaries use the DTW for multiple purposes like irrigation, drinking, domestic, fisheries, livestock, industrial and so on.
4. There has been direct participation of the community in implementation of the project in the following ways:
   (a) Deposit of 10% money of the total cost of the irrigation equipment i.e. Tk. 84,000.00 to the Academy;
   (b) All the expenses incurred for electrical connection are completely borne by the WUA;
   (c) The cost for internal domestic pipe networks along with the fittings is completely borne by the individual users.
   (d) The operation and maintenance cost of the project are also borne by the groups.
5. Different IGA-based sub-groups have been formed and their access to credit in compliance with the set criteria is ensured.
6. This model has already attracted the attention of different national and international agencies. A Memorandum of Understanding (MOU) has been signed between the World Bank and RDA, Bogra to replicate this model in South Asia Region.

(2) Project brief:

A. Name of the project : **Socio-Economic Development and Quality of Life Through Arsenic Free Safe Drinking Water Supply.**

B. Objectives of the project : The main objective of the project is to improve the socio-economic condition and quality of rural life through ensuring arsenic free potable drinking water supply by expanding RDA-developed safe water model (filtration plant and low-cost DTW). The specific objectives of the project are as follows:

i. To install low-cost filtration plant for ensuring potable arsenic free drinking water supply according to the guidelines of WHO/Bangladesh standard.

ii. To develop health status of the rural people by increasing per-capita water consumption.

iii. To uplift socio-economic status of the rural people engaging them in different income generating activities.

iv. To reduce the level of water-borne diseases

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Duration of the project : 2001-2006

E. Major Activities : Major activities of the project (July 2002-June 2003)

Training :

- To provide the group members with training on on-farm water management, skill development and technology transfer.
- To conduct orientation course on arsenic free safe drinking water supply system.

Action Research: A total of four sub-project areas have been selected under action research component.

i) Pirijpur, Godagari, Rajshahi;
ii) Sayedpur, Sujanagar, Pabna;
iii) Vangura Bazar, Vangura, Pabna;
iv) CARB village, Godagari, Rajshahi.

F. Research outcome :

1. The capital cost of RDA-developed DTW ranges from Tk. 60 thousand to Tk. 3.15 lakhs depending on different discharge capacity and depth of the well. At least 30-40% cost could be reduced compared to traditional one having the same capacity.

2. Beneficiaries are using the DTW water for different

purposes viz, irrigation, drinking, pisciculture, livestock and poultry rearing and also for other domestic and industrial purposes.

3. The overall achievement of the motivational training is found courses effective and satisfactory for the Water Users' Association.

4. The beneficiaries are directly involved in implementation process in the following ways:

   (a) Deposit of 10% money of the total capital cost of the project i.e. Tk. 1,80,000.00 to the Academy at the initial stage;

   (b) Cost of electric connection charge is completely borne by the group;

   (c) The cost for internal domestic pipe networks along with fittings are completely borne by the individual users;

   (d) The operation and maintenance cost of the project is also borne by the groups;

5. Formation of different IGA-based sub-groups is under way.

6. This model has attracted the attention of different national and international agencies. A Memorandum of Understanding (MOU) has been signed between the World Bank and RDA, Bogra to replicate this model in South Asia Region.

(3) Project brief:

A. Name of the project : **Rural Plant Clinic in Bangladesh**

B. Objectives of the project :

In Bangladesh insects and diseases are real threats to agriculture production causing on an average 20-30% crop losses in farmers' fields. In order to protect crops from damage, farmers are becoming increasingly dependent on the use of highly toxic pesticides used with increasing frequency. In most cases, farmers use pesticides on the basis of recommendations and advice from the local pesticide dealers, who themselves are not generally professionals. Overuse of pesticides comes from a misunderstanding of what is causing the problem, and is often attributed to insect-pests due to their high visibility. Farmers also have common misconceptions, believe all insects to be pests.

In response to the strong demand of the farmers the Rural Development Academy (RDA) in collaboration with the UK based Global Plant Clinic (GPC) started an action research project in March, 2005 and developed three model of Rural Plant Clinics (RPC) in Amrool Union under Shajahanpur Upazilla in Bogra. Each of the RPCs is providing plant health service to the farmers of surrounding 6-8 villages. The clinics are being set-up in the premises of elected women member of Union Parishad who were undergone intensive training on how to organize, run and maintain simple but effective community run Plant Clinic. RPCs are providing written prescription to the farmers for solving their simple plant health problems.

Objective

To develop a community owned Rural Plant Clinic model for South Asia.

C. Financed by : Global Plant Clinic, UK, DAE, AUP

D. Project Period **2005-2010**

E. Research outcome :

- Organized II plant doctor's monthly conference.
- Clinic team developed, validated and distributed 100 new fact sheets addressing specific plant health issue.
- GPC organized electronic data management course for research team at RDA

(4) Project brief:

A. Name of the project : **Creation of Additional Employment, Increase in Marginal Productivity of Labour in Rural Economic Activities and Poverty Alleviation Through Irrigation and Water Management.**

B. **Objectives of the project :**

The main objective of the project is to alleviate poverty through quick extension of RDA-developed irrigation and water management model by creating additional employment of the rural people for better rural livelihood.

The specific objectives of the project are as follows:

1. To extend RDA-developed low-cost multipurpose use of DTW model;
2. To extend/replicate RDA-developed low-cost water, filtration plant model for supplying safe drinking water in the rural areas;
3. To ensure highest production through safe water supply, training, and micro-credit assistance;
4. To ensure multipurpose use of water resources like irrigation, drinking water supply, horticulture nursery development, poultry and livestock rearing, fish cultivation, food processing and preservation etc.;
5. To create additional employment for the rural people;
6. To increase additional food production for meeting up incremental national food demand;
7. To ensure proper processing in agricultural production;
8. To ensure proper marketing network including export through co-ordination between production, processing and modern irrigation technology; and
9. To develop socio-economic and quality of life of the rural people.

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Project Period 2005-2009

E. **Major Activities:**

Component of Proposed Activities at a Glance:

- Installation of Low-cost DTW on the basis of recent technological option developed by RDA, Bogra;
- Construction of multipurpose overhead tank;
- Construction of low-cost buried pipe irrigation system;
- Construction of networks for safe drinking water supply;
- Cropping technology transfer through demonstration and training;
- Installation of nursery and production of vegetables;
- Developed livestock, poultry and fisheries farm with community Bio-gas plant;

- Introduction of agrobased small industry;
- Provision of multi-dimensional training to the different target group;
- Distribution of seed capital among the beneficiaries;
- Identification of appropriate credit operation system;

F. **Research outcome :**

Lesson Learnt :

5. On the basis of IGA training cum RDA credit facility, micro entrepreneurship have been developed in the project area.
6. Beneficiaries are using the DTW water for different purposes i.e. irrigation, drinking, pisciculture, livestock and poultry rearing and also for other domestic and industrial purposes.
7. The beneficiaries are directly involved in implementing the project in the following ways:

   (e) Deposited 10% of the total capital cost of the project i.e. Tk. 2,20,000.00 to the Academy at the initial stage;

   (f) Cost of electric connection charge is completely borne by the management group;

   (g) The internal domestic pipe networks along with fittings are completely done by the individual users;

   (h) The operation and maintenance cost of the sub-project are also borne by the groups;

Future Plan

i. The total capital cost of the project will be recovered within 10 years;

ii. The project activity will be extended in another areas through project cost recovery; and

iii. The project activity will be monitored and continued through CIWM by its own income for sustainability.

Observations

1. Employment generations have already been started on agro based sectors in the sub-project areas.
2. On the basis of IGA training cum RDA-credit facility, micro entrepreneurship have been developed in the sub-project area.
3. Beneficiaries are using the DTW water for different purposes i.e. irrigation, drinking, pisciculture, livestock and poultry rearing and also for other domestic and industrial purposes.
4. The overall achievement of the training course is quite satisfactory.

(5) Project brief:

A. Name of the Project : **Action Research Project on Increasing Irrigated Area through Transferring RDA-model of Irrigation and Water Management Technology in Southern and Hill Districts of Bangladesh.**

B. Objectives of the project :

The main objectives of the project is to meet up increasing demand of food and provide food security for uplifting the socio-economic condition of the rural people by transferring RDA-model of irrigation and water management technology in the non irrigated areas of Southern and Hill District Areas.

The specific objectives of the project are as follows:

i. To explore the possibility of the best use of surface and sub-surface water irrigation in the non irrigated area;
ii. To undertake exploratory drilling for finding best aquifer for DTW installation;
iii. To install observation well for ground water monitoring;
iv. To demonstrate and disseminate RDA-model (multipurpose use of water resources) for irrigated command area development;
v. To conduct training programmers for stakeholders on skill development IGAs for their capacity building and poverty alleviation.
vi. To enhance food production by increasing irrigated area within the project area;
vii. To ensure enhanced crop production by selecting appropriate cropping patterns in the costal and hill areas.

C. Financed by : GoB

D. Duration of the project : 2006-2010

E. Major Activities of the project :

- Explore surface and sub-surface water irrigation in the non irrigated area;
- Exploratory drilling for finding best aquifer for DTW installation at hilly areas.
- Installation of observation well for ground water monitoring.
- Demonstrate and disseminate RDA-developed irrigation and water management technology.
- Skill development training programmes
- Crop production by selecting appropriate cropping patterns in the costal and hill areas.

F. Research outcome :

- Targeted training and action research sites are achieved.
- Employment generations have already been started on agro based sectors in the sub-project areas.
- On the basis of IGA training cum RDA-credit facility, micro entrepreneurship has been developed in the sub-project area.
- Irrigation coverage under the proposed area will contribute to additional food production in Bangladesh.
- A study shows that irrigation coverage was about 10% in Hill districts. By introducing RDA-technology, a total of eight sites have already been successfully completed under its action research activities.

(6) Project brief:

A. Name of the project : **Action Research Project on Command Area Development using Surface Water for Rural Livelihood Improvement by Replicating RDA Technology.**

B. : **Objectives of the project :**

The project mentioned above is an ADP funded project. The project period was 5 years (July 2007 – June 2012) and the total cost was Tk .1490.82 lakh. Total 25 sub-project sites were developed over the project period. Considering its potentials, the project was revised to Tk. 2821.52 lakh to expansion of the project activities in another 20 sites of southern districts. This project is being implemented by the CIWM of RDA, Bogra.

Main Objectives

The main objectives of the project is to upliftment of socio-economic status of rural people for better livelihood through-

a) Increased food production by efficient use of surface water.

b) Creation of additional employment opportunity.

Specific objectives

i. Expectable increase of crop production by efficient use of surface water through installation of buried pipe irrigation system.

ii. Increase of food production to meet up the demand of increased population of 21st century.

iii. Undertaking of different kinds of training of income generating activities to create additional employment opportunities.

iv. Reduction of irrigation cost and load shedding by saving electricity power consumption.

v. Maintenance of ecological balance of ground water resources by strengthening surface water irrigation management.

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Project Period 2007-2015

E. Major Activities :

- Infrastructure development for command area development and drinking water supply.
- IGA Training.
- Credit operation

F. Research outcome : A total no of 45 Surface Water Sub-projects out of 45 sites have been completed for the period. On the other hand facility developed on 20 sub-project areas.

Observations

- Targeted training and action research sites are achieved.
- Employment generations have already been started on agricultural sectors in the sub-project areas.
- On the basis of IGA training cum RDA-credit facility, micro entrepreneurship have been developed in the sub-project area.
- RDA-model of water resources development using surface water have been resulted very encouraging.
- Crop yield increased from16 mounds/bigha to 26 mounds/bigha in Kaliakour Surface water supply Sub-Project, Bogra site, because of using surface water and buried pipe irrigation system.

(7) Project brief:

A. Name of the project : **Action Research Project on Poverty Alleviation through Livestock Management and Bio-Gas Bottling (Revised)**

B. Objectives of the project : This project is an ADP funded project. This project has already been revised. As per approved RDPP the total No. of sites will be 112 instead of 12. The project cost is Tk. 5155.74 lakh instead of Tk. 1161.40 lakh. This project will continue upto June 2014. This project is being implemented by CIWM, RDA, Bogra.

Main objectives:

To reduce poverty through developing skilled manpower on different IGAs by conducting training and training-match RDA-credit as well as producing renewable energy.

Specific objectives:

i. To impart different types of IGAs training on livestock management, bottling of Bio-gas and organic manure production;
ii. To ensure income generating activities by supplying RDA-Credit programme on simple terms and conditions.
iii. To save electric power and natural gas.
iv. To generate localized electricity at the sub-project sites for changing the lifestyle of the project beneficiaries and
v. To uplift over all socio-economic condition of the rural people.

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Project Period : Nov. 2009- Dec. 2015

E. Major Activities :

i) Construction of bio-gas plant for generating bio-gas;
ii) Installation of bio-gas operated generator and power supply network for supplying localized power supply in each project area;
iii) Ensure facility of mobile Bio-gas bottling plant;
iv) Installation of low-cost DTW for ensuring water supply for drinking as well as domestic purpose;
v) Conduct IGAs training for capacity building specially on beef fattening, homestead gardening, horticulture and nursery development, livestock management;
vi) Distribute hazard free cattles among the beneficiaries for beef fattening on traditional lease basis;
vii) Ensure training-match RDA credit program to the beneficiaries for under taking different types of IGAs;
viii) Ensure continuous monitoring and evaluation of the project activity;
ix) Dissemination of technology through organizing several workshops and seminars.

F. Research outcome : ✓ Community biogas technology might be one of the best

ways for meeting up energy crisis in Bangladesh.

- ✓ Community based organic manure production & utilization is very much effective for soil health improvement and quality crop production.
- ✓ In the northern territories of Bangladesh where the solar intensity is very high, solar thermal power plant can be installed for both photovoltaic and solar thermal technology, Bangladesh is a perfect location.
- ✓ RDA developed Community based Biogas Plant (CBP) and Two-storied Agriculture with Solar Irrigation System found as the best options to be replicated at each village of Bangladesh for sustainable technology as a means of socio economic change in rural livelihood.

Observation

For more development, quick extension, popularization and replication of RDA's experience in the filed level and as well as new technologies of renewable energy, Board of Governors (BoG) of RDA has been approved RERC under the administrative control of RDA.

(8) Project brief:

A. Name of the project : **RDA-Cornell University, USA Collaborative Water Saving Raised Bed Project for the Central-West Region of Bangladesh**

B. Objectives of the project :

Raised Bed (RB) technology is a novelty in the world of resource saving agro-technologies for the small farm dominant countries like Bangladesh. This is a system technology consisting of bed and furrow and based on the applied concept of raising crops on beds. A bed former (BF) machine is central to this technology that simultaneously makes bed and furrow on even untilled soil, mixes fertilizer and sows seed on the bed in a single run. This technology is capable to provide multiple economic benefits especially to the struggling resource-poor farmers. It raises crop productivity in one hand, and reduces input cost, on the other. Yield increase takes place thanks to the 'border effect' on the on-bed crop. Virtually all crops of food, feed and fiber nature can be grown with this technology.

Launched in 2010 and funded by USDA-FFP Bangladesh Program of the Cornell University, USA, the Raised Bed Project is being implemented by RDA in Bogra, Joypurhat, Naogaon and Sirajganj districts.

Main objectives

a) Enhancing agricultural production technology for small farmers by providing training on the raised bed technology, and

b) Assisting agribusiness development to support farmer technology adoption through development of machinery and provision of loans to tillage service providers.

Specific objectives

i. Arrange demonstrations of the Raised Bed (RB) technology model in the farm of the selected Lead farmers (LF) in the command area with the crops of farmer and local interest.

ii. Organize Field days in the demo fields to demonstrate the results and in-situ Farmers' Field School (FFS) to train farmers in the RB technology.

iii. Promote crop diversification with the HVCs applying RB technology at those sites where cropping intensity is still low and scope exists to boost farmer income.

iv. Centrally arrange separate RB technology demos at the RDA farm in each season involving a large number of seasonal crops to demonstrate the results to the LFs of the command area and the local farmers.

v. Hold special training courses centrally at RDA for the LFs on the BF operation and maintenance.

vi. Organize experience sharing visits of the LFs to the similar activity areas of the RWRC Rajshshi sites.

vii. Locally develop BF manufacturers to promote agribusiness in this area.

viii. Conduct loan program for the farmers interested in purchasing the BF+PT machines to facilitate RB tillage service in the fields of the adopters of this technology and raise their income thereof.

ix. Produce print materials (leaflet, brochure, poster, festoon etc) and electronic materials (video CD) for publicity and use of this technology for the wider clientele.

x. Ventilate the project output via media (print, CD and TV) and workshops and seminars to the wider clients: farmers, policy makers, rural development practitioners, agro-service agents, private agribusiness companies, and so on to popularize the merit of the RB technology.

C. Financed by : USDA/University, USA

D. Project Period 2010-2013

E. Major Activities :

- During the early, mid and late Rabi season of 2012-13, a total of 33 new demo sites were selected including 18 in Bogra, 7 in Joypurhat, 5 in Naogaon and 3 in Sirajganj district.
- At those sites 42 LFs were selected including 20 in Bogra, 7 in Joypurhat, 7 in Naogaon and 8 in Sirajganj district on whose farms, a total of 44 demos were arranged including 25 on potato, two on maize, 14 on boro, and one each in wheat, coriander leaf spice and aroid.
- 21 different crops were demonstrated on the RB in the command area in the reporting period.
- In addition, two RB trials on maize in collaboration with the Syngenta Company's Bogra branch were arranged at its two sites of Bogra district.
- Centrally at the RDA farm, demos on 20 different crops were held of non-rice crops and rice.
- Training course on the BF Operation & Maintenance was arranged for 67 LFs in two batches at RDA.
- For farmers' experience sharing, a batch of 24 selected LFs

were taken to two of the RB Extension sites (one each in Puthia and Charghat upazilas) of RWRC Rajshshi.

- Field days were held at all sites at crop maturity which were attended by a total of 1094 visitors including farmers, DAE extension agents, agribusiness holders, professionals of agricultural and rural development institutions.
- Documentation materials such as posters, brochures and leaflets and a video on the project activities were developed and distributed at every relevant event including RDA APC.
- As routine work, loans were distributed to the new buyers of the BF+PT sets and loan repay drive was continued.
- An RB Tech Stall was set up at the 'International Winter RDA Tech Fair 2012' held in the RDA premises where visitor turnout was about 8000.
- RB tillage service to the new adopters of the technology in the command area was rendered by the 22 BF+PT set owners of different villages as per their own plan.

F. Research outcome : RAISED BED FARMING is a conservation agriculture started in RDA demonstration farm in collaboration with Cornell University, USA.

Bed Planting Technology

1. Increase yield 20%
2. Save irrigation water 30-42%
3. Improve N fertilizer efficiency
4. Reduced production cost by minimum tillage
5. Buffers drought and flood (climate change)

Success of the RB Technology, insist Govt. to replicate the technology in wide scale through a new GoB funded project

Observation:

- RB technology is spreading its promises to the farmer's field and machine manufacturers' lab alike.
- As true for every new technology extension, patience is needed for capturing wider attention of the farming community towards mass adoption of this technology.
- For the benefit of the poor majority farmers of Bangladesh, RDA should continue the expansion efforts of this multiple benefit technology through government or donor support since the project has ended in last May.

(9) Project brief:

A. Name of the project : **Action Research Project on Integrated Water Management (IWM)**

B. Objectives of the project : This is an ADP funded project. Its duration is 3 years (January 2011- December 2013). The project cos is Tk. 5982.00 lakh. This project is being implemented by CIWM, RDA, Bogra. Under this project a total of 75 sites will be developed.

Main Objectives

1) To reduce the poverty level through RDA-developed Integrated Water Resources Management (IWRM) and market-led livelihood promotion intervention in rural areas of Bangladesh.

Specific objectives

i. To ensure integrated use of surface and sub-surface water for irrigation, potable water supply, fisheries, nursery development, beef fattening, poultry rearing, horticulture and homestead gardening etc. and non-farm activities;

ii. To ensure highest agricultural production through efficient (90%) and economic use of water resources as well as training and credit support;

iii. To generate additional employment/income through better access in integrated water resources management and

iv. To introduce community-base bio-gas for better waste management and organic manure production as well as for hygiene promotion and changing the lifestyle of the project beneficiaries.

C. Financed by : Government of Bangladesh under Annual Development Programme (ADP)

D. Project Period : 2011-2014

E. Major Activities : **Training**

Training is one of the major components of project. There was a provision for providing training to the project beneficiaries to make them skill on their field of interest and improvement of their socio-economic level. A total of 2290 beneficiaries have been trained up which is over the target of 2290 (100%) for the year 2012-13. The cumulative trained person is 5033 out of 8721(58%) upto the current financial year.

F. Research outcome : A total of 18 Sub-projects out of 18 sites (100%) have been completed for the year 2012-13. The cumulative total 36 out of 75 sites (48%) have already been completed upto the current financial year.

(11) Project brief:

A. Name of the project : **Safe Water Supply, Sanitation & Bio-gas Technology for Rural Livelihood Improvement in Climate Victim People of Bangladesh**

B. Objectives of the project : The above mentioned project is a climate change trust funded project. Its duration is 3 years (July 2011 - June 2014). The project cost is Tk 1398.00 lakh. This project is being implemented by CIWM, RDA, Bogra. A total of 13 sites (one site from one district) will be implemented under this project within the project period. The specified districts are Chittagong, Rangamati, Cox-Bazar, Khulna, Satkhira, Barguna, Pirojpur, Jamalpur, Mymensingh, Kishorgonj, Bogra, Madaripur and Netrokona.

Main Objectives

Livelihood improvement for climate victim people through RDA-developed water management technology.

Specific objectives

i. To ensure potable (life saving) water supply for livelihood improvement;
ii. To develop environment friendly waste management system for environmental safety;
iii. To ascertain better livestock management;
iv. To reduce poverty through developing skilled manpower on different IGAs by conducting training;
v. To improve socio-economic level of the resource poor farmers' through training-match RDA-credit with micro saving program.

C. Financed by : GOB

D. Project Period 2011-2014

E. Major Activities : Training is one of the components of project. There was a provision for providing training to the project beneficiaries to make them skill on their field of interest and improvement of their socio-economic level. A total of 200 people out of 200 (100%) project beneficiaries in the project area.

F. Research outcome : A total of 5 sub-projects out of 5 sites have been completed for the year 2012-2013. Cumulative total 10 out of 13 (77%) have already been completed up to the current financial year.