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Agricultural Advisory Society (AAS)

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Acronyms/Abbreviations

AAS	Agricultural Advisory Society
AESPs	Agricultural Extension Service Providers
BADC	Bangladesh Agricultural Development Corporation
BAPA	Bangladesh Paribesh Andolon
BARI	Bangladesh Agricultural Research Institute
BAU	Bangladesh Agricultural University
BDT	Bangladeshi taka (the currency of Bangladesh)
BINA	Bangladesh Institute of Nuclear Agriculture
BLB	Bacterial Leaf Blight
BLS	Bacterial Leaf Streak
BMGF	Bill & Melinda Gates Foundation
Boro	Winter Rice, Transplanting: December-February
BRAC	Bangladesh Rural Advancement Committee
BRF	Bangladesh Rice Foundation
BRKB	Bangladesh Rice Knowledge Bank
BRRI	Bangladesh Rice Research Institute
BSFB	Brinjal shoot and fruit borer
BSGDMA	Bangladesh Seed Grower Dealer & Merchants Association
BSMRAU	Bangabandhu Sheikh Mujibur Rahman Agricultural University
BVF	Bio-Village Forum
CABI	-
CBOs	Community Based Organizations
CDSP	Char Development & Settlement Project
CIMMYT	International Maize and Wheat Improvement Center
CPD	Community Plant Doctor
DAE	Department of Agricultural Extension
DFID	Department for International Development
EAL	Energypac Agro Ltd
EC	Executive Committee
ED	Executive Director
FAMPAT	Farmer's participatory training
FAO	Food and Agriculture Organization
FARMSEED	Farmer-to-farmer seed exchange system
FGD	Focused Group Discussions
FoSHoL	Food Security for Sustainable Households Livelihood
GDP	Gross Domestic Product
GOB	Government of Bangladesh
GSI	Good Seed initiative

IDE	International Development Enterprise
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IPM	Integrated Pest Management
IPM/ICM	Integrated Pest Management/ Integrated Crop Management
IRRI	International Rice Research Institute
KAP	Knowledge, Attitude and Practice
Kg	kilogram
KGF	KRISHI GOBESHONA FOUNDATION
MOA	Ministry of Agriculture
MOU	Memorandum of Understanding
MT	Metric Ton
MVs,	Modern Varieties
NGOs	Non Government Organizations
NOJ	Nodi-o-J-ibon
NSB	National Seed Board
OP	Open Pollinated
POs	Partner Organizations
PPP	Power Point Presentation
PRICE	Poverty Reduction by Increasing the Competitiveness of Enterprises
PSO	Principal Scientific Officer
R & D	Research and Development
RDA	Rural Development Academy
RDC	Research & Development Center
RDRS	Rangpur Dinajpur Rural Service
ROMI	Result Oriented Monitoring Indicators
RPFs	Resource Poor Farmers
SAAOs	Sub-Assistant Agriculture Officers
SAU, Dhaka	Sher-e-Bangla Agricultural University
SEDF	Soros Economic Development Fund
IFC	International Finance Corporation
SME	Small Medium Enterprise
SPM	Safe Pest Management
STRASA	Stress Tolerant Rice for Poor Farmers of Africa and South Asia
T. Aman	Late Summer Rice, Transplanting: July-August/September
t/ha	ton/hectare
TMSS	Thengamara Mohila Sabuj Sangha
USA	United States of America
USAID	United States Agency for International Development
WRC	Wheat Research Centre

Vision

To promote sustainable agricultural production strategies in order to improve the livelihood of Bangladesh's rural poor

Mission

To create more wealth in the hands of small and poor farmers, by improving their agricultural skills and capacities and by demonstrating ways in which they can better manage their available resources.

Background of AAS

The AAS Approach to Agricultural Development: AAS has, from its earliest days, approached the challenges of agricultural development in Bangladesh from the perspective that Bangladesh, after all, is a rich country, blessed with abundant agricultural resources, (i.e., fertile land, plenty of low cost farm labor and abundant reserves of easily available, continuously renewed fresh water). AAS believes that Bangladesh's endemic poverty is simply a reflection of its lack of capacity to effectively manage its rich endowment of agricultural resources. Furthermore, the nation has been too slow in developing its agricultural production capacity. Accordingly, AAS has focused its available energies on helping Bangladesh's farmers to become more productive; to, in the context of their rich land, small plots, plentiful labor resources and abundant supplies of fresh water, substantially increase their output.

AAS's sustainable agricultural development strategies are focused on:

- ***Modifying traditional agricultural practices to accommodate higher yielding production***
- ***Advocating the use of sustainable intensive cropping, fishery and livestock production strategies***
- ***Using field based demonstrations to model " a higher standard of best practice"***
- ***Popularizing its strategies through a network of community based partners***
- ***Using state of the art training modules: Farmer's participatory training (FAMPAT) and Focused Group Discussions (FGD) to overcome knowledge and skill deficits***
- ***Emphasizing poverty alleviation, gender equity and environmental preservation***
- ***Promoting participatory approaches at every stage of project planning and implementation***

Bangladesh has traditionally been a rice-based society; indeed, it remains so today. Now that the country has reached food-grain self-sufficiency, AAS is pioneering the introduction and popularization of high value, non-rice and specialty-rice crops along with their in-field irrigation technique. AAS has made a material contribution to the introduction and popularization of new, higher yielding strains of well-known vegetable, fruits, spices and specialty rice varieties. Through its demonstration based training programs, AAS has helped small plot cultivators adapt their farming practices to accommodate the requirements of higher value, higher yielding crops, fishery and livestock. AAS is using state of the art training methodologies to accelerate the uptake of promising new varieties and improved agricultural technologies. Accordingly, AAS's agricultural programs have materially affected the capacity of Bangladesh's small plot farmers to increase their wealth on the basis of a more efficient use of their quite formidable resources. Their results have been impressive.

Background of AAS Establishment

The idea of establishing an agricultural NGO to provide quality technical support to other, more generic NGOs; developing their capacity in the field of agricultural was first mooted by a group of prominent professionals including Dr. David Gisselquest, Mr. Harun-Ar-Rashid, Dr. A.J.M Azizul Islam, William H. Derrenger, Dr. Noel P. Magor, Carol M. Derrickson, Dr. Tariful Islam and Dr. Humayun Kabir in 1989. With this end in view, this group formed a non-profit, non-political, rural service provider and civil society organization called Agricultural Advisory Services. To meet government and registration requirements the name was later changed to Agricultural Advisory Society (AAS) from January 1991.

Since its inception, AAS has implemented a numerous projects to alleviate poverty among the resource poor and small farmers of Bangladesh. AAS has been working as a bridging organization for technology transfer between farmers, partner organizations (POs), community based organization (CBOs) input/output traders, Department of Agricultural Extension (DAE) and other research institutions (eg. BRRI for rice technology, BARI for non-rice crop technology and BADC as a source of foundation and certified seed, etc)

Project Activities and Achievements

AAS implemented a number of projects/activities to alleviate poverty among the resource poor and small farm families of Bangladesh. The major activities and achievements of AAS during January to December 2010 are as follows:

I. Scale-up salt tolerant rice variety

AAS has been implementing a project on "Scale-up salt tolerant rice variety through FARMSEED (Farmer-to-farmer seed exchange system) under STRASA (Stress tolerant rice for poor farmers of Africa and South Asia) project of IRRI funded by Bill & Melinda Gates Foundation (BMGF) since 1 June 2008 in southwest coastal region of the country.

The purpose of the project is to establish a community based sustainable FARMSEED; ensuring, in the process, the availability of quality rice seed of salt tolerant varieties on a sustainable basis and at affordable price in coastal regions of Bangladesh. This has been implementing through empowering the farmer's decision-making ability and by enhancing their skill in quality seed production processing, preservation and distribution for scale-up salt tolerant rice varieties (e.g. BRRI dhan 47 & 41) in Satkhira, Khulna and Bagerhat districts with 20 member NGOs of Oitijhya NGOs network and 150 CBOs (community based organizations) in south west coastal region of the country. The summary project progress during 2009-10 T.Aman and 2009-10 Boro seasons is presented below:

CBO representatives and NGO staff at training

A. 2009-10 T.Aman: BRRI dhan 41

A total of 3066 Kg seed of BRRI dhan 41 distributed among 1411 trained seed farmers at 56 communities of 20 member NGOs in Satkhira, Bagerhat, Khulna and Pirojpur districts in southwest coastal region during 2009-10 T.Aman season. About 60% established seedbeds and seed production plots were damaged due to several regions including high salt content in

soil and water during the crop production cycles. Out of 56060 Kg produced paddy of BRRI dhan 41, of which about 4% used as seed by the farmers in the project areas.

Farmers at FGD on BRRI dhan 41

Total of 18 rice cultivars were enlisted as existing rice cultivars through FGDs, of which modern varieties were 11 and local varieties were 7 in southwest coastal region. Among the recommended 10 MVs, the highest level recommendation was for BR 23 followed by BR 11, BR 10, BRRI dhan 30, BR 22 and rest 5 MVs recommended at lower levels in the project areas.

B. 2009-10 Boro season: BRRI dhan 47

A total of 2000 Kg foundation seed of BRRI dhan 47 distributed among trained 818 seed farmers of 19 member NGOs in Satkhira, Khulna and Bagerhat districts, of which 754 seed farmers established seedbeds during 2009-10 Boro seasons. Out of 754 established seedbeds, 312 seedbeds were damaged due to high salinity of soil and irrigation water. Moreover, out of 442 established seed plots with BRRI dhan 47, of which 87 plots were damaged due to high soil and irrigation water salinity. However, out of 442 established seed plots, the highest proportion of plots were established as good crop (50%) followed by crop damaged (20%), very good crop (14%), moderate crop (10%), bad crop (5%) and very bad crop (1%). Out of 72797 Kg of produced paddy, about 1% used as seed by the farmers in the project areas.


BRRI dhan 28 damaged plot & BRRI dhan 47 survived plot under high salinity

Besides Oitijhya NGOs network, CBOs (community Based Organizations) network has established in collaboration with member NGOs of Oitijhya to provide cost-effective extension services including scale-up salt tolerant rice varieties among the farmers in Satkhira, Khulna and Bagerhat districts of southwest coastal region. Out of 152 actively involved CBOs, 75 CBOs, 42 CBOs and 35 CBOs were involved with CBO network in Satkhira, Khulna and Bagerhat districts respectively. Out of 152 member CBOs, 102 CBOs are IPM/ICM clubs, 39 CBOs are Samobay Samity and 11 CBOs are community clubs in 3 project districts. Total of 101 representatives from the involved member CBOs of the network participated in day long three training events, of which 73 representatives from IPM/ICM

CBO representatives and NGO staff are enlisting the existing rice cultivars in southwest coastal region

club, 21 representatives from Samobay Samity and 7 representatives from community club in three project districts. Total of 134 rice cultivars were reported (with duplication for several cultivars) as existing cultivars by the participated farmers (CBO representatives) in 3 training events in three districts, of which 79 local and 55 modern rice varieties were enlisted as existing rice cultivars in 3 project districts for T. Aman and Boro seasons.

II. AAS-PRICE Project Activities

PRICE (Poverty Reduction by Increasing the Competitiveness of Enterprises) is a USAID-funded economic development project in Bangladesh. Its mission is to reduce poverty by increasing the competitiveness in aquaculture, horticulture and leather sectors, particularly for the benefit of women, young adults and SME suppliers. To accomplish its mission PRICE undertakes interventions to address key constraints limiting the growth of sales, jobs and investments in the accepted 3 sectors in general. The major activities and achievements of AAS with PRICE supported horticulture and fishery projects during January to December 2010 are as follows:

A. Horticultural Project

PRICE has been working to achieve its mission through undertaking various interventions on horticulture sector for strengthening the value chain of the horticultural crop produces and their processing products. As per MOU, PRICE has been working with Agricultural Advisory Society (AAS) to address the constraints faced by commercial farmers under the AAS proposed project on "Demand-driven horticultural crop production and marketing" at 18 locations with 18 CBOs in Natore, Pabna and Rajshahi districts. Accordingly, PRICE has been assisting AAS in the training and motivation of 540 commercial farmers; helping them to organize commercial contract farming system in order to plan market driven production, increase unit yield and at the same time, improve the quality of horticultural produces by adopting environment friendly production practices. To implement the activities of the project, on Demand-driven horticultural crop production and marketing, PRICE has been supporting AAS, providing horticultural specialists and field supervisors to support 540 farmers in market driven production planning of high value horticultural crop production. However, PRICE has been working in collaboration with AAS to explore the potential for developing a flow of market information regarding the demand and supply of targeted horticultural products. PRICE has been assisting AAS to support farmers for increasing productivity, minimize post harvest losses and access to market in producing commercial horticultural crops. The horticultural specialist has been implementing training on improved cultivation techniques, farming management system, use of better inputs, adoption of environment friendly practices, better plant health management, post harvesting management/handling and establishing demonstration plots for showing best practices/introducing good agricultural practices and conducting field days in those.

PRICE interventions under horticultural project

1. Project Location

PRICE in collaboration with AAS has been implementing the activities of accepted project on "Demand-driven horticultural crop production and marketing" at 18 communities in Natore

(Baraigram, Gurudaspur and Lalpur upazilas), Pabna (Ishurdi upazila) and Rajshahi (Putia upazila) districts. Out of 18 working communities of AAS/PRICE project, 10 communities are in Natore district and 4 communities in each Pabna and Rajshahi districts.

2. Commercial farmers' group

PRICE has been working with 18 AAS developed commercial farmers groups in Natore (10 groups), Pabna (4 groups) and Rajshahi (4 groups) districts to implement the Demand driven horticultural crop production and marketing strategy since its inception. Each group has a group coordinator with 30 representative active members. Large numbers of farmers are involved with each group, who produced high value horticultural crops for marketing (540 group members & 2066 federation members). All groups are qualified to grow any potential and suitable high value horticultural crops through commercialized contract farming system with reliable buyers, those who are capable to procure the horticultural produces from farm gate using "farm to market" strategy.


Group meeting cum training at Manikpur, Natore

3. Working team

Four members working team and additional staff of AAS in collaboration with group coordinators were undertaken the following interventions/activities under the overall supervision of Horticultural Specialist, PRICE and in consultation with the team leader, Horticulture, PRICE during the reporting period.

4. Group meeting cum training

At the beginning of project intervention, working team and relevant AAS staff conducted the group meeting cum training at 18 communities in Natore, Pabna and Rajshahi districts. Each group meeting cum training conducted in collaboration with group coordinators. Total of 681 farmers participated in 18 group meeting cum training at 18 communities in 3 project districts.

5. Constraints for Brinjal production and marketing

During group meeting cum training at 18 communities in 3 projects districts, facilitators documented the major constraints for Brinjal production and marketing on the basis of participated farmers' comments and suggestions. Such major constraints are similarly applicable for other horticultural crops. The summarized constraints and their status for Brinjal production and marketing in Natore, Pabna and Rajshahi districts are presented in the following Table.1.

Table.1: Constraints and their status for Brinjal production and marketing in Natore, Pabna and Rajshahi districts.

Constraints	Scale (1-5)			
	Natore	**Pabna**	**Rajshahi**	**Average**
1 Plant health problems identification and management				
(a) Insects-pests	5	5	5	5
(b) Plant diseases	5	5	5	5
(c) Pesticides quality and lack of advice on application	5	5	5	5
(d) Nutrient deficiency identification	5	5	5	5
2. Soil health and its management	4	4	4	4
3. Adulteration in fertilizers	5	5	5	5
4. Brinjal marketing				
(a) Un-predictable market price during production cycle	4	4	4	4
(b) Lack of proper sale center	4	4	4	4
(c) Local markets control by Foria (middleman)	4	4	4	4
(d) Products transportation	3	2	1	2
5. Working capital	1	1	1	1
6. Irrigation facility and method	3	2	4	3
7. Seed availability	2	2	2	2
8. Lack of field advice on production practices	4	4	4	4
9. Lack of knowledge on improved harvesting and post harvesting handling practiced	4	4	4	4

6. Selection of existing potential horticultural crops

At the beginning of the project intervention, AAS-PRICE's working team enlisted the existing horticultural crops at 18 communities in Natore, Pabna and Rajshahi districts during group meeting cum training. After enlisting the horticultural crops, potential crops were selected through farmers' assessment using scaling (scale: 1-5) approach during group meetings and FGDs followed by validation at 18 communities in 3 project districts. Potentiality of horticultural crops were assessed at 18 communities in Natore, Pabna and Rajshahi districts on the basis of their acreage, production, productivity, profitability, market demand, market access etc. Numbers of potential horticultural crops of 18 communities are provided in the following Table.2

Table.2: Existing number of potential horticultural crops of 18 communities

SL #	Community	Upazila	District	Crops (Nr.)[1]
1	Khamar Pathuria Akkanda Para KUF	Gurudaspur	Natore	10
2	Kodim Chilan	Lalpur	Natore	10
3	Purbo Noyapara	Gurudaspur	Natore	17
4	Dhola	Lalpur	Natore	12
5	Manik pur	Baraigram	Natore	10
6	Khamar Pathuria Madrasa Para	Gurudaspur	Natore	5
7	Lakshmipur	Baraigram	Natore	8
8	Modhya Noyapara	Gurudaspur	Natore	19
9	Purbo Noyapara	Gurudaspur	Natore	10
10	Dhulia	Baraigram	Natore	14
11	Char Gorgoria	Ishurdi	Pabna	16
12	Gorgoria	Ishurdi	Pabna	23
13	Rahimpur	Ishurdi	Pabna	18
14	Kalampur	Ishurdi	Pabna	26
15	Nandonpur Fozdari Para	Putia	Rajshahi	10
16	Chak Bhitapara Bhaluk gachi	Putia	Rajshahi	14
17	Majpara Bhaluk gachi	Putia	Rajshahi	10
18	Telipara Bhaluk gachi	Putia	Rajshahi	8
Average		**-**	**-**	**13**

[1] *Total 46 enlisted potential horticultural crops are selected at 18 communities*

7. Safe pest management initiative

The country is lagging behind in the development and implement of efficient, eco-friendly plant health management practices. It is an irony that in spite of the known serious consequences, pesticides, in most cases, still serve as the only method used in protecting crops from massive insect/pest-born losses. Pesticides are often used indiscriminately and at very high rates of application and very frequently without knowledge the actual purpose of the pesticide being applied. In order to protect high value non-rice crops from pest and disease damage, farmers are day-by day becoming increasingly dependent on the frequent use of dangerous and highly toxic pesticides with about 30-40% pesticides cost of the total production cost. Moreover, pesticide adulteration is an increasingly common experience among farmers. In most cases, farmers use pesticides in their crop fields on the basis of recommendations and advice from their local pesticide dealers. In general, the dealers, themselves are not professional crop/soil/pest scientists and thus we have a situation of the "blind leading the blind" with certain

incentives for both farmers and dealers to advocate the use of inappropriate and/or excessive pesticide levels.

Thus, safe pest management (SPM) is found crucial for all type of crops in general and horticultural crops in specific for safe products consumption within and outside of the country. Safe pest management (SPM) concept includes several control methods and techniques including integrated pest management (IPM), use of sex pheromone, parasitoids releasing, Bio-pesticides use, cultural control, ecological control, biological control, resistant varieties use, use of physical and mechanical methods, use of various traps, destruction of crop residues and affected plants/plant parts, tillage, clean planting materials use etc. In this regards, the working team undertaken following interventions under the overall supervision of Horticultural Consultant, PRICE:

(a) Training

Power Point Presentation (PPP) based farmers' training: About 500 farmers participated at 4 power point presentation (PPP) based 4 hours training events at Manikpur, Khamar Pathuria Madrasha Para and Lakshimpur villages in Natore district. Power point presentation based training on safe pest management was found highly acceptable among the farmers in the project communities in Natore district. The PPP based training events were conducted by the senior Entomologist from BARI and safe pest management (SPM) specialist from Ispahani Biotech. Both the specialists conducted the ppp training events on SPM covering the pest such as Brinjal shoot and fruit borer (BSFB), fruit fly of gourds and fruits (e.g, jujube, mango etc). Such training events motivated the large number of farmers within and outside of the project communities.

Farmers at PPP training on Safe Pest Management

Farmers' participatory safe pest management training: Farmers' participatory day-long safe pest management training implemented by AAS under the support from PRICE in collaboration with group coordinators at 18 communities at the selected venues in Natore, Pabna and Rajshahi districts. At the beginning of the 1 day farmers' participatory training on safe pest management, Horticultural Specialist, PRICE provided orientation training among the project field supervisors and relevant field staff of AAS on the implementation of the training on safe pest management on prepared flip chart. Day-long training was divided into two sessions, such as theoretical session and practical session. Both training sessions were conducted based on the guidelines developed

PRICE & USAID team at farmers' participatory training on SPM

by Ispahani Biotech in collaboration with BARI. Theoretical training session was conducted through using prepared Flip Chart and following participatory approaches all through the training session. Such farmers' participatory training events on safe pest management conducted following with two methods such as (i) Sex pheromone trap use and (ii) Parasitoids releasing in crop fields for BSFB, fruit fly for gourds and fruits trees. On the other hand practical training session was conducted at Brinjal crop field through practical set-up demonstration on sex pheromone trap and releasing parasitoids (Tricograma and Bracon) in the Brinjal crop field.

A total of 989 farmers were participated at 18 training events on safe pest management at 18 project communities in Natore, Pabna and Rajshahi districts. Out of 989 participants, 152 were female farmers. District-wise number of total participants and events are provided in the following Table.3.

Table.3: District wise number of training events and participants

District	Events (Nr.)	Participants (Nr.)
Natore	10	622
Pabna	4	185
Rajshahi	4	182
Total	**18**	**989**

Most of the participated farmers showed their willingness to introduce safe pest management practices in their horticultural crop fields/orchards through field demonstration at their horticultural crops fields with in-field technical support at least for one cropping season. Moreover, trained farmers suggested for marketing the pesticide free safe horticultural products with better price from their crop fields.

Group Coordinators and dealers training: A day-long training conducted on safe pest management for horticultural crop production by AAS with funding and technical support from PRICE on 23 January 2009 at training room, AAS, Bonpara, Natore. Total of 21 participants attended at the day-long training course, of which 13 were group coordinators, 3 were agri-inputs (pesticides, fertilizers, seed etc) dealers (Natore & Rajshahi districts) and 5 staffs of AAS. Kdb. Md. Ibrahim Khalil, senior scientific officer, Ispahani Biotech conducted training through multimedia power point presentation (PPP) during theoretical session followed by practical session in the Brinjal crop field at Bonpara, Natore and Harun-Ar-Rashid, Executive Director, AAS acted as a facilitator both at theoretical and practical sessions of the training. Dr. A.B. Siddiqui, Team Leader, Horticulture, PRICE attended as a resource person in the training course and he also facilitated both the training sessions.

Group coordinators and dealers at Safe Pest Management training

Day long training for group coordinators and dealers on safe pest management for horticultural crop production was conducted by Mr. Ibrahim Khalil on (i) Use of sex pheromone trapping

method, (ii) Parasitoids releasing techniques (Tricograma, Bracon etc), (iii) Bio-pesticides use and (iv)other IPM approaches for various horticultural crops including Brinjal, Gourds and fruit trees.

(b) Demonstration on safe pest management

AAS established 9 acres demonstration on safe pest management with sex pheromone trap and releasing parasitoids (Tricograma and Bracon) on brinjal shoot and fruit borer (BSFB) and fruit fly of Bottle gourd. Out of 9 acres demonstration, 8.5 acres was on BSFB at Khamar Pathuria Madrasha Para on 7.5 acres as block demonstration with 27 farmers and 1.0 acre as cluster demonstration with 5 farmers at Poschim Noyapara in Gurudaspur upazila of Natore district. Demonstration on BSFB has been established at little late during early harvest the fruit of Brinjal. On the hand about 50 decimals demonstration plot was established on Bottle gourd at Dhala village in Lalpur upazila of Natore district. Post establishment of demonstration plots on SPM, regular field visit and advices were provided by the working team under the overall supervision of PRICE Horticultural Specialist.

PRICE and USAID team at Safe Pest Management demo. plot

8. Plant health management initiative

Plant health problem's diagnosis and management is reported as one the prime constraint for cultivation of high value horticultural crops at 18 working project communities in Natore, Pabna and Rajshahi districts. Accordingly, 4 permanent plant clinics established at Khamar Pathuria Madrasha Para, Khamar Pathuria Akando Para, Manikpur and Dhulia in Natore district to provide plant health management services on demand driven basis.

On the basis of farmers demand from the communities, plant health management services provided at 4 plant clinics during January to December 2010 by plant doctor of AAS and plant

Farmer receiving prescription from Plant health Specialist (Left) and Plant health Specialist presenting at Going Public event (Right)

health specialists from BARI and BSMRAU. Besides plant clinic operation a "Going Public" event was conducted at Purbo Noyapara Bazar in Gurudaspur upazila of Natore district on 5 major plant health problems of Garlic and Onion. During operation of plant clinic and implementation of "Going public" about 900 participated farmers received prescriptions on their wanted plant health problems.

9. Vermicomposting

Vermicompost is composting utilizing various species of worms, specifically red wigglers, white worms, and earthworms creating the heterogeneous mixture of decomposing manures, vegetable, food waste, bedding materials and pure vermicast produced during the course of normal vermiculture operation. Vermicast, similarly known as worm castings, worm humus or worm manure, is the end-product of the breakdown of organic matter by the species of earthworm. It contains water-soluble nutrients and bacteria; vermicompost is an excellent, nutrient rich organic fertilizer and soil conditioner. The process of producing vermicompost is called vermicomposting.

Earth worms can consume practically all kinds of organic matter and they can eat their own body weight per day (eg. 1 Kg worms can consume 1 Kg of organic matter/residues every day). The excreta (Castings) of the worms are rich in several plant nutrients, such as nitrate, available forms of P,K, Ca and Mg. Organic wastes can be ingested by earthworms and egested as a peat like material terms as vermicompost.

Earth worms are divided into two groups: Humus formers and humus feeders. The first group dwells on the surface feed on fresh organic materials. They are generally red in colour, have a flat tail and are also called epegic or detritivorous worms. The second group, the humus feeders, is deep borrowing worms that are useful in making the soil porous and mixing and distributing humus through the soil. The most common types of earthworms used for vermicomposting are brandling worms (*Eisenia foetida*) and redworms or red wigglers (*Lumbricus rubellus*) and both are thermo-tolerant. *Eisenia foetida* is commonly used for cowdung vermicomposting in India. It has wide range of temperature tolerance, has very high reproductive potential and is less sensitive to density pressure.

However, AAS in collaboration with PRICE has undertaken initiative in vermiculture cum

Released Earthworm on the cow dung of ring (Left) and Earthworm releasing on the cow dung of ring (Right)

vermicomposting with 20 farmers at project communities in Natore district as demonstration. Large number of farmers visited vermicomposting demonstration and showed their willingness to start vermicomposting with technical support and earthworms supply on cost basis. The

working team undertaken motivational activities at 18 working communities in 3 working districts.

Farmers' group coordinators and lead farmers' a day training on vermicompost production and use was conducted by AAS in collaboration with PRICE at Training Room, Zonal Office,

Dr. Gul Hossain speaking at the training (Left) and Practical demo. of the vermicomposting (Right)

AAS, Bonpara, Natore on 29 May 2010. Dr. Gul Hossain and Ms. Shonavan Begum, were provided both theoretical and practical training on vermicompost production and use during 9:30am to 4:30pm under overall facilitation of Harun-Ar-Rashid, Executive Director, AAS. A total of 26 farmers were participated in the day long training events on vermicompost production and use from AAS/PRICE working communities in Pabna, Natore and Rajshahi districts. At the end of the day long training event, participants were developed an **Action plan** on vermicompost production at AAS/PRICE working villages in 3 working districts under the facilitation of Harun-Ar-Rashid, Executive Director, AAS on the basis of availability of efficient species of earthworms from reliable sources in the country.

10. Exotic crop varieties demonstration

AAS in collaboration with PRICE established 34 farmers' participatory field demonstration plots with five exotic crops (Red Cabbage, Brocolli, Tomato, Bitter gourd and Khira) and their hybrids at Manikpur, Khamar Pathuria Madrasha Para and Lakshimpur villages in Natore district during 10 Rabi season. Farmers' received training on the cultural practices for the involved five exotic crops before sowing the seeds. Trained farmers received only seed of the involved crop varieties from AAS. .Post sowing in-field advices were provided by the project staffs, consultant and external specialists. Project staff conducted bi-weekly field monitoring on the established demonstration plots at 3 project villages. Crop performance assessment has been conducting by the project staff. Both red cabbage and Brocolli were found as highly acceptable crops among the farmers

Demo. farmers harvesting Red Cabbage for marketing

at demo. villages and their surrounding villages at production side but other end of the market side farmers faced difficulties. However, Red cabbage and Brocolli can be grown at large scale in Natore district through establishing contract farming system with committed buyers from urban and up-scale urban markets in the country.

11. Soil analysis

To recommend the fertilizers doses for the involved horticultural crop production, representative 36 soil samples were collected from 18 project communities in Natore, Pabna and Rajshahi districts for analysis at reputed soil analytical laboratory in the country. Representative soil samples were collected by the project staff in collaboration with group coordinators and lead farmers at 18 communities in 3 project districts. Collected 36 soil samples were processed at AAS, office for analysis at reputed soil analytical laboratory in the name of representative farmers of the project communities of 3 project districts.

Field supervisors collecting soil samples for analyzing

12. Lead farmer's training on Brinjal production practices

Day-long farmers' participatory training conducted on sustainable commercial Brinjal production practices by AAS in collaboration with PRICE on 10 January 2010 at training room, AAS, Bonpara, Baraigram, Natore. Total of 9 group coordinators and lead farmers participated in the participatory day-long training course from Natore, Pabna and Rajshahi districts. Six relevant field staff of AAS participated in the training course. The participatory training course was conducted by Specialists of PRICE and participatory approaches were followed during day-long training course on sustainable commercial Brinjal production practices. Day-long training on sustainable commercialized Brinjal production included various issues such as (i) Existing Brinjal cultivars and their cultivation period, (ii) Sustainable Brinjal production practices, (iii) Sustinable Brinjal seed production practices, (iv) Cost and return analysis for Brinjal production, (v) Safe pest management and (vi) Marketing channels for Brinjal produces for Natore, Pabna and Rajshahi districts. Compilation of the participatory training were incorporated in the production guidelines of Brinjal for conducting farmers' training at project 18 communities in 3 districts on sustainable Brinjal production practices.

Lead farmers at training on Brinjal production practices

13. Training on zero-tillage Garlic production

Day-long farmers' participatory training on zero-tillage garlic cultivation conducted at 6 communities in Gurudaspur and Baraigram upazilas of Natore district during the reporting period of the Annual report. Total of day-long 6 events of farmers' participatory training on zero-tillage garlic cultivation were conduced at 6 communities in Natore district where farmers are grown garlic in large scale using zero-tillage techniques. Zero-tillage garlic technology is the innovation of farmers in Natore district. But there is a lot of scope to improve the production practices of zero-tillage garlic cultivation methods to harvest higher yield than presently they are harvesting. Total of day-long 6 events of farmers' participatory training on zero-tillage garlic cultivation conducted in Gurudaspur and Baraigram upazilas of Natore district in collaboration with 6 group coordinators, project field supervisors and AAS staff under the guidance and overall supervision of Horticultural Specialist of PRICE. At the beginning of the farmers' participatory training on zero-tillage garlic cultivation, PRICE Horticultural Specialist provided orientation training among the project field supervisors and relevant staff of AAS on the implementation of the training on zero-tillage garlic cultivation using prepared flip chart. Day-long training was divided into two sessions-such as (i) cultivation techniques along with cost of production analysis and (ii) crop health management. Project field supervisors and relevant field staff of AAS implemented the training on zero tillage garlic cultivation at 6 communities in Gurudaspur and Baraigram upazilas of Natore district. A total of 270 farmers (15 female farmers) were participated at day long 6 training events on zero-tillage garlic cultivation at 6 communities in Natore districts.

Farmers at training on Zero-tillage cultivation of Garlic

14. Field advices

Project working team, headed by horticultural specialist of PRICE provided in-field advices on (i) Brinjal production practices, (ii) Zero-tillage garlic production practices including plant health management; (iii) Plant health management on Onion production; (iv) Onion seed production practices including plant health management; (v) Nut weevil of Jujube. During field visit of the horticultural specialist and other team members distributed the prepared fact sheets on the major plant health problems of the above crops among the group coordinators and lead farmers at 18 project communities in Natore, Pabna and Rajshahi districts.

15. Farmers training on Brinjal production and marketing

Before conducting farmers training, horticultural specialist of PRICE and working team collected relevant information on Brinjal production practices and techniques with existing cultivars in Natore, Pabna and Rajshahi districts in collaboration with group coordinators and lead farmers of 18 project communities. Existing Brinjal cultivars and their production cycles of 8 communities are documented. Variety-wise sowing and transplanting period for 8 locations in Natore, Rajshahi and Pabna districts and year round Brinjal production plan and tentative price (Tk./maund) with suitable cultivars of Brinjal are summarized. Farmers' participatory day long training on sustainable Brinjal production techniques implemented by AAS in collaboration with PRICE at 11 communities in Pabna and Natore districts during April-May 2010. Total of day-long 11 events of farmers' participatory training on sustainable Brinjal production techniques were conducted at 11 communities in 2 project districts in collaboration with 11 trained group coordinators, project field supervisors and AAS staff under the overall supervision of Harun-Ar-Rashid, Executive Director, AAS. Before implementation of 11 day long training events on sustainable Brinjal production techniques, guidelines and flipcharts were prepared on sustainable Brinjal production techniques giving special emphasis on quality seedlings production, plant health management practices, year round Brinjal cultivation with locally adopted varieties, seed production practices and safe pest management. At the beginning of the farmers' participatory day long training on sustainable Brinjal production techniques, PRICE's horticultural specialist provided orientation training among the project field supervisors and relevant staff of AAS on the implementation of the training events. A total of 330 farmers were attended at day long 11 training events on sustainable Brinjal production techniques at 11 communities in Pabna and Natore districts.

Demonstration on sex pheromone trap at farmers training

16. Trichoderma introduction

Trichoderma spp. is most prevalent antagonistic soil fungi reproduce asexually by conidia born on phialides of branched conidiophores. The most important antagonistic mechanisms of the fungi are mycoparasitism, antibiosis and competition. Trichoderma spp. parasitizes a good number of soil-borne fungi and is used as bio-control agents against phytopathogeniic fungi, such as Phythium, Phytophthora, Rhizoctonia, Fusarium and Verticillium. Trichoderma spp. play major role as biocontrol agents, owing to their capabilities of ameliorating crop-yields of multiple role, such as bio-pesticide and plant growth promotion. Accordingly, AAS in collaboration with PRICE was undertaken an initiative to demonstrate healthy seedlings production of Brinjal among the PRICE trained farmers in Pabna and Natore districts through treating the seedbed soils. Monitoring on seedbed was undertaken through using developed format. Performance of Trichoderma on healthy seedlings production of Brinjal was summarized by the project staff.

B. Fishery Project

In Bangladesh fish is an integral part of the diet and accounts over 70% of the animal protein

Pisciculture specialist conducting training on pond fish culture (Left) and practical demo (Right)

intake of the country population. Annual average consumption of fish amounts to some 7.5 Kg/ capita. The fisheries sector of Bangladesh account for about 4% of the GDP and for more than 4% of the export earnings, it provides employment for over 1 million people. Presently pond fish culture plays significant role in national fish production mostly through carp poly-culture fish farming. Most of the fish farmers of the country are very much lack in knowledge on improved fish culture techniques to achieve higher fish production per unit water body. Accordingly, practical training on improved pond fish culture is crucial for the involved fish farmers all over the country. As per MOU between PRICE and AAS, fish farmers training programme has been undertaken to improve key production and management practices for improved pond fish culture in Gurudaspur upazila of Natore district during 1 July-31 December 2010.

Before imparting the training on improved pond fish farming, working team of AAS and PRICE formed 10 fish farmers groups as 10 CBOs at 10 pond fish farming clusters in Gurudaspur upazila of Natore district. Each group formed with 50 fish farmers from the same community with a fish farmer group coordinator. Thus, 500 commercial fish farmers from10 Machh Chasi Groups as 10 CBOs are involved with AAS-PRICE aquaculture project activities in Gurudaspur upazila of Natore districts with 10 group coordinators. List of Machh Chasi groups and number of fish farmers for each group are provided in the following Table.4.

Table.4: Machh Chasi group-wise number of fish farmers in Gurudaspur upazila of Natore district.

Sl #	Group Name	Members (Nr.)
1	Dhanura	50
2	Purulia	50
3	Brigorila-1	50
4	Maharajpur-1	50
5	Raninagar	50
6	Brigorila-2	50
7	Kusumhati	50
8	Brichapila	50
9	Moharajpur Vitapara	50
10	Gojendrochapila	50
Total		**500**

At the beginning of the fish farmers training, aquaculture expert prepared an improved aquaculture training module (hand-out) on the basis of training need assessment from the involved fish farmers of 10 Machh Chasi Groups in the project areas. Aquaculture expert in collaboration of other members of the working team conducted day-long training on improved pond fish farming system management at the involved 10 project communities in Gurudaspur upazila of Natore district. Each group has received 3-days training on improved pond fish farming system management. Three-days training course covers various demand-led relevant issues such as (i) Pre-stocking fish pond preparation/management; (ii) Stocking management practices; (iii) Post stocking management and (iv) Inputs supply and output marketing strategy. Both theoretical and practical events were included in the improved pond fish farming management. Aquaculture expert also conducted pre and post evaluation with the participated fish farmers before and after execution of the training. Total of 500 enlisted fish farmers from 10 Machh Chasi groups in Gurudaspur upazila of Natore district participated in 3-days training course on improved pond fish farming management during 1 July-31 December 2010. Out of 500 participants of the training, 7 were female fish farmers from 10 Machh Chasi groups in Gurudaspur upazila of Natore district (Table.5).

Table.5: Group-wise number of participants, training dates for phase-I and phase-II of training schedule

Sl #	Group Name	Date of Training		Number of Participants		
		Phase-I	Phase-II	Male	Female	Total
1	Dhanura	31 July & 1 Aug	12 Dec	43	7	50
2	Purulia	2-3 Aug	23 Dec	50	0	50
3	Brigorila-1	18-19 Aug	14 Dec	50	0	50
4	Maharajpur-1	21-22 Aug	15 Dec	50	0	50
5	Raninagar	22-23 Oct	26 Dec	50	0	50
6	Brigorila-2	25-26 Oct	19 Dec	50	0	50
7	Kusumhati	27-28 Oct	20 Dec	50	0	50
8	Brichapila	31 Oct & 1 Nov	21 Dec	50	0	50
9	Moharajpur Vitapara	4-5 Nov	13 Dec	50	0	50
10	Gojendrochapila	6-7 Nov	22 Dec	50	0	50
Total				**493**	**7**	**500**

III. Strengthening FARMSEED approach

It is well accepted that seed is the single most important input any plant-based agricultural production system. Seed quality determines the upper limits of crop yield potential and therefore the productivity off all other inputs is constrained by the quality of the seed ingredient. Accordingly, improved seed can frequently make a substantial, incremental contribution to overall agricultural productivity, doing so at relatively little incremental cost. A farmer's risk

declines substantially if the genetic and physical purity of the seed is maintained. There is evidence that using quality rice seed alone can increase rice yield as much as 20% irrespective of the management practices. In contrast with formal seed systems, which operate at national level, informal seed systems operate mainly at the community level. Informal seed systems are typically quite flexible, involving variety of exchange mechanisms, which facilitate the distribution of seeds between participating households (e.g. cash/barter). Informal seed systems can be regarded as traditional in that they normally involve long-standing, well-established practices and links between seed products and consumers. Little improvement of informal seed system can ensure the availability of quality seed in the hands of farmers, especially resource poor farmers at the community level and FARMSEED is an example. Thus, AAS has developed FARMSEED approach, which is the combination of formal and informal seed system and fully sustainable to ensure quality seed supply of the demanded crops among the farmers in general and rice in specific.

Currently, AAS has been using FARMSEED approaches for Wheat, Onion, Mustard, Mug bean and several OP vegetable crops. However, AAS has undertaken initiative for dissemination of

Demo. seed production plots on Prodip variety of Wheat (Left) and Taherpuri Onion seed plot (Right)

Prodip variety of wheat (Latest and high yield variety) through FARMSEED approach with 100 farmers at 10 villages in Baraigram upazila of Natore district during 2009-10 winter season through training and demonstration. All most all trained seed farmers stored seed of Prodip variety wheat in poly bag for the next season sowing by their own, exchange and sell to neighbor farmers at house or at market. Similarly commercial onion seed production and marketing of Taherpuri variety has undertaken with about 200 farmers in Gurudaspur, Lalpur and Baraigram upazila of Natore district through training and market linkage during 2009-10 winter season. All commercial onion seed farmers sold their produced Taherpur onion seed mostly during sowing season of 2010-11 after storing at their house using traditional storage method.

IV. Plant health services initiatives

Crop loss are increasing due to pests and diseases for crop loss are increasing due to pests and diseases for rice and other crops including high value vegetables, fruits and spices in Bangladesh. Farmers are increasingly dependent on the frequent use of highly toxic pesticides. Farmers are concerned about pesticide adulteration by wholesalers and retailers, while using pesticides based on advice from local pesticide dealers leading to pesticide abuse. In general,

the dealers, themselves are not professional in crop health management and thus we have a situation of the “blind leading the blind” with certain incentives for both farmers and dealers to advocate on plant health problem diagnosis and the use of inappropriate and/or excessive pesticide levels. However, the current low-level of plant protection safety may lead to greater human health risks to consumers, farmers and sprayers. To understand plant health problems, AAS has undertaken initiatives on plant health management in collaboration with CABI, UK since 1 September 2005. AAS initiatives on plant health services management during 2010 are described below:

A. Plant clinic operation

The plant clinic is a centre where investigation and diagnosis of plant health problems can be undertaken and advice on control measure dispensed. It can also provide a base for doing surveys of crop health problems and farmers’ needs and as an information centre for extension service providers and farmers. The plant clinic is a new approach for providing effective plant health services on plant health problems to farmers. The approach has been introduced for the farmers in Baraigram upazila of Natore district of Bangladesh by AAS in collaboration with CABI, UK since 1 September 2005.

AAS has established a network of model plant health management permanent clinic to ensure better plant health management services to the farmers in Natore district, so that they can

Dr. Eric Boa, CABI at plant clinic operation at Tirail (Left), Manikpur (Middle) and Dhulia (Right) permanent plant clinics

enhance their crop production, reduce cost of crop production by avoiding the frequent use of chemicals, increase their income and remove the risk of crop failure due to the pest and disease infestation and finally, they save the environment from pollution. Besides operation of permanent plant clinic, piloting has been undertaken on three extension methods such as

Dr. Eric Boa, CABI at going public event (Left), open mobile clinic event (Middle) and Safe pest management demo plot with sex pheromone and parasitoids on Brinjal (Right)

mobile plant clinic (open), mobile plant clinic (fixed) and going public to ensure better plant health management services to the farmers in Natore district. Assigned plant doctor

(Pathologist/Entomologist) is solely responsible in operation of permanent plant clinic and piloting the extension methods for better plant health management services in Baraigram upazila of Natore district. Based on the expected success, AAS later intends to scale up the most effective method(s) in other parts of the country. To achieve the objectives of plant health management clinic network, AAS in collaboration with 15 Agricultural Extension Service Providers (AESPs) has made significant progress in Baraigram upazila of Natore district from 1 January-31 December 2010 and the progress is given below in brief under the following sections

Total of 2035 farmers received prescriptions on their plant health problem at the events of permanent plant clinic, mobile clinic and going public operations in Natore district during 1 January to 31 December 2010. The highest number of prescriptions provided under Kachua

Unknown health problem of Banana (Left), minor of Pointed gourd (Middle) and Anthracnose of Guava (Right)

plant clinic (231) followed by parcole plant clinic (226), Perbagdop plant clinic (220), Merigacha plant clinic (214), Moukhara plant clinic (186), Jonail plant clinic (183), Ahamedpur plant clinic (162), Raynavarot plant clinic (148), Chandai plant clinic (125), DK Bazar plant clinic and Tirail plant clinic (117) and lowest under Ramagari plant clinic (106) during 1 January to 31 December 2010. Average about 170 prescriptions were received by the farmers under each plant clinic during 2010 in Natore districts. Besides, assigned plant doctor of AAS, plant health specialists

Unexpectedly farmer like to pay for the prescription (Left), Plant health specialists providing /preparing prescriptions (Middle) and Mealy bug on Mango fruit (Left)

from Bangladesh Agricultural Research Institute (BARI) and Bangabandhu Sheikh Mujibur Rahman Agricultural University (BSMRAU) also provided advice and prescriptions among the farmers during mainly permanent plant clinic along with few mobile plant clinics and going public operation in Natore district. During plant clinic operation assigned community plant doctors played vital role for effective plant health services among the farmers in collaboration with trained group coordinators. Plant clinic wise number of prescriptions provided by the plant doctors, community plant doctors and plant health specialists is presented in the following Table.6.

Table.6: Plant clinic-wise number of prescriptions provided among the participated farmers during 1 January to 31 December 2010.

PC #	Plant clinic Name	Prescription (Nr.)
1	Ahamadpur	162
2	Ramaigari	106
3	Rayna Varot	148
4	Merigachhi	214
5	Perbagdob	220
6	Moukhara	186
7	Tirail	117
8	Chandai	125
9	DK Bazar	117
10	Jonail	183
11	Parcole	226
12	Kachua	231
Total		**2035**

B. Training

(a) Community plant doctor and Group Coordinator training: Day long training conducted for community plant doctors (CPDs), 12 AAS plant clinic and group coordinators of AAS/PRICE project on "How to be a Plant Doctor" by Dr. Jeffery Bently, CABI and Harun-Ar-Rashid, ED,

AAS at Zonal Office, AAS, Bonpara, Natore by two batches on 20 July 2010 and 21 July 2010 respectively. As per schedule, 1st batch training was conducted for community plant doctors (CPDs) from 12 permanent plant clinics of AAS in Baraigram upazila of Natore district on 20 July 2010. Out of 24 CPDs, 23 CPDs participated in the participatory training from 12 permanent plant clinics on 20 July 2010 (Table.7). Similarly, the participatory training was conducted for the group coordinators of AAS-PRICE Horticultural project in Natore, Pabna and Rajshahi districts. Total of 30 group coordinators participated in the day long training course from 18 communities of Natore, Pabna and Rajshahi districts on 21 July 2010 (Table.7). The participatory training was conducted using the approach such as audio-video power point presentation, visual demonstration of relevant photographs of plant health problems, various exercise and plant health problems samples collection and identification of the collected plant health problems.

Table.7: Date and district-wise number participants of participatory training on "How to be a plant doctor"

Date	Participants (Nr.)			
	Natore	**Pabna**	**Rajshahi**	**Total**
20 July 2010	23	-	-	23
21 July 2010	7	19	4	30
Total	**30**	**19**	**4**	**53**

(b) CPDs training plant health problem: Day long 4 days training course conducted for 24 community plant doctors from 12 plant clinics on plant health problem management relating to insect pests and nematode by the highly experienced entomologists Dr. Z.H. Prodhan and Dr. Alim Uddin under the overall facilitation of Harun-Ar-Rashid, ED, AAS. Four days participatory training course was implemented through using audio video power point presentation (PPP) and discussion on the collected plant health problems samples. The training course was covered various issues such as basic concept on insect pest (Life cycle, morphology, feed habit etc), basic knowledge on pesticides (insecticide, mitecides), plant health problems diagnosis and management practices for 39 non rice crops, most of them are high value cash crops. As per schedule, each plant clinic will be provided hard copy of the training materials as fact sheet with a file. So that the trained CPDs will use such plant health documents during prescription on the plant health problems for their client farmers from the surrounding communities of the established plant clinics. In future soft copy will be provided to those who have access to computer facility.

CPDs from 12 plant clinics at plant health problem training

(c) Fact Sheet: A total about 130 fact sheets (draft & final) on the demand-led plant health problems have produced during this reporting period for distribution among the CPDs of AAS plant clinics, lead farmers and relevant users in the country. Such demand-led fact sheets development process has been undertaken from beginning of the plant clinic operation during 2005. Fact sheet preparation design was finalized on the basis of suggestions and recommendations from farmers, extensionists and plant health specialists in the country. Sample copy of fact sheet is provided in **Annex. I.**

(d) Performance and impact study: The performance and impact study on plant clinic operation was conducted by AAS in collaboration with RDA, Bogra, Shushilan Satkhira and

AAS staff interviewing farmers on impact study of plant clinic (Left) and Dr. Jeffery Bentley, CABI with CPD & farmers during Impact study (Right)

CABI. The study was designed to assess plant clinic operations, performance and impact in Bangladesh. The study was conducted with 350 respondents at 18 sites within the areas of influence of the 18 plant clinics of Agricultural Advisory Society (AAS), Rural Development Academy (RDA) and Shushilan. The study was conducted by Harun-Ar-Rashid, ED, AAS with staff of AAS, RDA and Shushilan. Field data was collected by Mr. Alok Kumar Biswas, AAS in collaboration with staff of AAS, RDA and Shushilan. The study was conducted during January-March 2010 in Natore (AAS), Bogra (RDA) and Satkhira (Shushilan) districts. Total of 350 farmers were interviewed, of which 230 from 12 plant clinics in Natore district with AAS, 60 from three plant clinics of Shushilan in Satkhira and 60 from three plant clinics of RDA in Bogra.

The 350 farmers surveyed received recommendations on 41 crops. The surveyed farmers

AAS staff validating the impact of plant operation at field (Left) and Dr. Jeffery Bentley, CABI with CPD & farm family members at Brinjal field during Impact study (Right)

brought in problems mainly for fruit and vegetables. Insects were high on the list than diseases. Total of 25 plant health problems diagnosed of seven vegetable crops in Natore with AAS, 23 plant health problems diagnosed of 12 vegetable crops in Satkhira with Shushilan and 27 plant health problems of 17 vegetable crops in Bogra with RDA. Similarly, 40 plant health problems diagnosed of 13 fruit crops in Natore, 12 plant health problems of five fruit crops in Satkhira and nine plant health problems of seven fruit crops in Bogra. The 18 plant clinics diagnosed 22 plant health problems with four spice crops in three districts. The plant clinics diagnosed 57 plant health problems with two cereal crops (rice and maize) in three districts.

V. Good Seed initiative (GSI)

A. woman-led vegetable seed production

AAS has significantly contributed in good seed initiative (GSI) phase-I as an active partner. As per MOU between AAS and RDA, Bogra, AAS has been working on production, processing, storage and marketing of selected vegetable seed crops for ultra poor women in 4 isolated chars in Sariakandi upazila of Bogra district since inception of GSI phase-II under the funding support from CABI,UK. AAS assigned staff in collaboration of TMSS staff under the overall supervision of RDA Bogra implemented various pre-decided activities in selected Noyapara, Dighapara and Chakrothinath chars under Hatsherpur union in Sariakandi upazila of Bogra district, such as (i) Providing training to women on vegetable seed production, processing, storage and marketing; (ii) Providing source seed of the selected vegetable crops for seed production; (iii) Providing in field advice on vegetable seed production; (iv) Collecting farmers innovation for vegetable seed video production; (v) Assisting trained and motivated seed women at project chars for preparing plan on seed production and marketing; (vi) Assisting in vermicomposting and vermicompost use in vegetable seed production plots at project chars; (v) Conducting cost analysis for vegetable crop and seed production in collaboration with trained women seed producers at the project chars in Sariakandi upazila of Bogra district during 2010.

Women chars dwellers at vegetable seed training in Bogra

B. Impact study on good seed initiative of WRC

In collaboration with Wheat Research Centre (WRC), Dinajpur, an impact study was conducted on wheat seed activities for good seed initiative (GSI) of WRC in Dinajpur, Thakurgoan, Panchagar, Nilphamari and Kurigram districts during July-October 2010. The study was conducted by Harun-Ar-Rashid, ED, AAS in consultation with Dr. Elahi Baksh, PSO, WRC,

K.M. Alauddin, AAS (Left) and Dr. Elahi Baksh, PSO, WRC (Right) interviewing farmers on the impact of GSI for the wheat

Dinajpur. Field data was collected by Mr. K.M. Alauddin, AAS in collaboration with staffs of partner NGOs, DAE and wheat farmers' group leaders under the overall supervision of Harun-Ar-Rashid, team leader of the study team. Field data were collected through interviewing 302 respondents (151 from project village and 151 from control villages) followed by conducting focus group discussion (FGD) and interviewing staff of NGOs and DAE (SAAO) by the study team at 41 villages in 10 upazilas of five Northwestern districts.

(a) Relative quality of wheat seed: Among the 151 project farmers, the highest number of farmers recalled as good quality wheat seed (75.50%) sown during 2009-2010 wheat cropping season followed by farmers recalled as moderate wheat seed quality (21.85%) and excellent wheat seed quality (2.65%). On the other hand, among the 151 non-project farmers, the highest number of farmers recalled as good quality wheat seed (65.56%) sown during 2009-2010 wheat cropping season followed by farmers recalled as moderate wheat seed quality (33.77%) and excellent wheat seed quality (0.66%). However, about 12% more project farmers used good and excellent quality wheat seed during 2009-2010 wheat cropping season than non-project farmers. On the other hand 18% more non-project farmers used moderate quality wheat seed during the same wheat cropping season.

Lead female farmers speaking at FGD with SAAO, DAE

(b) Comparative wheat seed supply sources: Five and eight wheat seed supply sources are reported as single and multi-sources respectively by the project and non-project farmers in five northwestern districts. Among the five single sources, the highest number of project farmers procured/used wheat seed from their own saved seed (52.98%) followed by market (9.93%), other farmers (3.97%) and BADC/Project/NGOs (1.99%). In contrast, the highest number of non-project farmers procured/used the wheat seed from market (54.97%) followed by other farmers (21.19%), BADC (6.62%), own saved seed (5.30%) and projects/NGOs (0.66%) in five Northwestern districts.

(c) Cultivation of wheat variety: A total of eight wheat varieties were cultivated by the responding project and non-project farmers in five northwestern districts during 2009-2010 wheat cropping season. Among those wheat varieties, Prodip and Shatabdi were found most popular at project villages. On the other hand, Shatabdi, Kanchan and Prodip were found most popular at control villages. The highest number of project farmers cultivated Prodip variety of wheat (37.09%) followed by Shatabdi (30.46%), Prodip/Shatabdi (15.23%), Sourav (4.64%) and rest varieties at minimum percentage with the users (farmers) at project villages. In contrast the highest number of non-project farmers cultivated Shatabdi (29.80%)

Farmers at FGD event in Nilphamari district

followed by Kanchan (29.19%), Prodip (18.54%), Sonalika (11.92%), Sourav (5.30%) and rest varieties at minimum percentage with the users (farmers) at control villages.

(d) Storage method for wheat seed: About 76.82% project farmers and 7.95% non-project farmers stored wheat seed during 2009-2010 wheat cropping season in five Northwestern districts. The highest number of project farmers stored wheat seed in poly bag + synthetic bag (45.70%) followed by in plastic drum (31.13%) and do not store (23.18%) during 2009-2010 wheat cropping season. In contrast, only about 5.96% non-project farmers stored wheat seed in poly bag + synthetic bag, 1.99% non-project farmers stored wheat seed in plastic drum and 92.05% non-project farmers do not store wheat seed in five northwestern districts.

Dr. Elahi Baksh, PSO, WRC visiting stored wheat seed in poly & gunny bag with trained farmers

(e) Quantity of wheat grain sells: Overall, average amount of wheat grain sold significantly higher with project farmers than non-project farmers during 2009-2010 wheat cropping season in five northwestern districts. Estimated average about 841.26 Kg per project farmer sold wheat grain that was 560.99 Kg per non-project farmer. However, estimated about 280.26 Kg higher wheat grain sold by project farmers than non-project farmers in the study areas.

(f) Wheat seed sold: Overall, average amount of wheat seed sold significantly higher with project farmers than non-project farmers during 2009-2010 wheat cropping season in five northwestern districts. Average estimated about 93.64 Kg wheat seed was sold per project farmer that was only 10.40 Kg wheat seed per non-project farmer. However, estimated about 83.24 Kg higher wheat seed sold by project farmers than non-project farmers in the study areas.

Farmers explaining about wheat seed production and selling

(g) Wheat seed buyers: About 32.45% project farmers and 94.04% non-project farmers did not sale wheat seed during 2009-2010 wheat cropping season in the project areas. Three types of wheat seed buyers are reported under each single type and multi-type buyers under project and control villages. The highest number of project farmers sold their wheat seed to farmers & markets (50 farmers) followed by market (20 farmers), Rich & poor farmers (17 farmers), poor farmers (13 farmers) and farmers & NGO (2 farmers) during 2009-2010 wheat cropping season. Both project and non-project farmers did not sale wheat seed among the rich farmers in the study areas. Only 9 non-project farmers sold wheat seed among farmers & markets (4), market (3), poor/rich & poor farmers (1) in the study areas.

(h) Own saved wheat seed sown: A total of 118 farmers sown of their own saved wheat seed during 2009-2010 wheat cropping season, of which 106 were project farmers and only 12 were non-project farmers in the study areas. Estimated average 61.24 Kg wheat seed was sown per farmer at project villages and average 51.33 Kg per farmer at control villages during 2009-2010 wheat cropping season.

(i) New income generating activities: Besides community based seed business, study team enlisted 30 common new income generating activities as expressed by 302 respondents at project and control villages in the study areas. About 16.56% and 17.88% estimated respondents at project villages and control villages respectively were not started any new income generating activities since 2007 in the study areas.

Gopal's dairy herd a new IGA

VI. Promoting hybrid rice technology

A. Rice hybrids field trials

The farmers' participatory field trial was conducted with 200 farmers on the selected rice hybrids released during 2008-9 at 20 villages with 20 CBOs in Tarash upazila of Sirajganj district and Gurudaspur and Baraigram upazilas of Natore district during 2009-10 Boro season. The purpose of the farmers' participatory rice hybrids field trials was to popularize the latest released rice hybrids among the farmers in Chalan beel of Natore and Sirajganj districts. Ten rice hybrids were selected for the field trial (Heera 6, Heera 4, AgroG1, AgroG2, BRRI hybrid dhan 2, SL-8H, BRRI hybrid dhan 3, BRAC-6, Shankar-3 and Mongol). Selected ten rice hybrids, their country origin, seed supplier and release year are provided in the following Table.8.

Table. 8: Selected rice hybrids, their country origin, seed supplier and release year

Rice hybrid	Country Origin	Seed Supplier	Release Year
Heera 6	China	Mitali Agro	2008
Heera 4	China	Supreme Seed Co	2008
AgroG 1	China	EAL	2008
AgroG 2	China	EAL	2008
BRRI hybrid dhan 2	Bangladesh	BRRI	2008
SL-8H	Philippins	BADC	2008
BRRI hybrid dhan 3	Bangladesh	BRRI	2009
BRAC-6	China	ACI Formulation	2009
Mongol	China	Northern Seed	2009
Shankar-3	China	ACI Formulation	2009

Total of 500 gm seed was provided for each rice seed grower at selected 20 communities in Challan beel of Natore and Sirajganj districts. One trained farmer at each community received

seed for only one selected rice hybrid (i.e. 20 farmers received for each selected rice hybrids at 20 communities in 2 districts).

Germination test of seed of the selected ten rice hybrids were conducted by AAS after procurement and before distribution among the trained 200 farmers. The post established rice hybrids field trial plots were monitored by the field Agronomist of AAS. Farmers' demand-led 20 field days were conducted at 20 communities in two project districts.

Seed procured and distributed of five rice hybrids (BRRI hybrid dhan 2, Heera 2, AgroG-2, SL-8H and LP-108) and BRRI dhan 28 among ten farmers for yield maximization farmers' participatory field trials in Tala upzila in Satkhira district during 2010-11 Boro season.

B. Study on hybrid rice in Bangladesh

More rice production could be obtained by expanding rice area, but the expansion of rice area is not possible in Bangladesh due to limited land availability for rice cultivation. Adoption of hybrid rice in Bangladesh shows that more rice could be produced even on less land with hybrid rice. Accordingly, China's hybrid rice technology is one of the options for vertical expansion of total rice production with a capacity to produce at least 20% higher yields than existing HYVs. Study on hybrid rice is conducted in collaboration with IRRI, BRRI & IFPRI during 1 July-31 December 2010. The study was conducted by a small group of experts which includes Harun-Ar-Rashid, AAS as collaborator, Dr. A.W. Julfiquar (Ex. head of hybrid rice Division & Director of BRRI) and Mr. Shajahan Ali (Seed Specialist).

From 1998-99 to 2009-10 a total of 85 rice hybrids have been released and notified in Bangladesh (Figure.I), out of which 80 come from private sector/NGO and 5 from public sector (4 from BRRI and one from BADC). Eight rice hybrids are developed in Bangladesh, of which 4 developed by BRRI, 2 developed by BARC and 2 developed by a private seed company. Out of 85 released rice hybrids, only 2 rice hybrids released for transplant Aman season. Thus, a total of 85 rice hybrids are available for commercial seed sale and seed production in Bangladesh. Most of these hybrids are sticky rice with amylose content less than 25% and most are also bold grain hybrids. From 1998 to 2010 a total of 44 organizations have been involved with hybrid rice technology transfer, seed selling and seed production in the country, of which private seed companies are recorded as highest (40) followed by NGOs (2), BRRI and BADC.

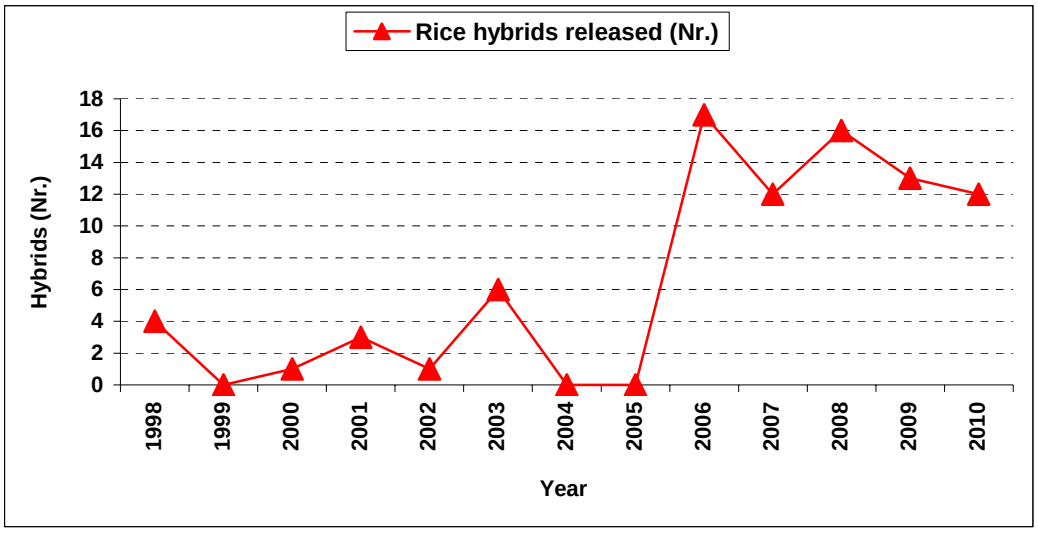

Figure. I: Hybrid rice variety released in Bangladesh during 1998-2010

In 9 years from 1998-99 to 2007-8, hybrid rice area increased about 4263% (0.024-1.011 million ha) and subsequently, hybrid rice area decreased it peak in 2007-8 by 7% in 2008-9 and by 34% in 2009-10. Clean rice production from hybrid rice increased about 4368% from 0.11 million MT in 1998-99 to 4.8 million MT in 2007-8, before falling to an estimated 4.31 million MT in 2008-09 and 3.15 million MT in the 2009-10. Such change in area and production of hybrid rice it estimated at very higher percentage due to very low base. High rice yield is estimated with more or less similar trends from 1998-99 to 2009-10 between 4.59-4.75 t/ha (Figure. II). Hybrid rice acreage and production was peak in 2007-08, this might be due to great push from Ministry of Agriculture (MOA) through DAE in collaboration with Private Seed Companies those were involved for hybrid seed marketing in Bangladesh. Following year in 2008-9 acreage of hybrid was declined due to higher price of chemical fertilizers, propaganda against hybrid rice regarding its disease susceptibility (BLB & BLS) during 2007-8 Boro season, trends of low paddy price at the beginning of sowing time of Boro season, less push from DAE on hybrid rice cultivation and comparative high market demand for popular inbred rice in the country. Further hybrid rice acreage was declined in 2009-10 due to low price of paddy in general and hybrid paddy in particular, very less push from DAE on hybrid rice cultivation and comparative higher market demand for popular inbred rice in the country.

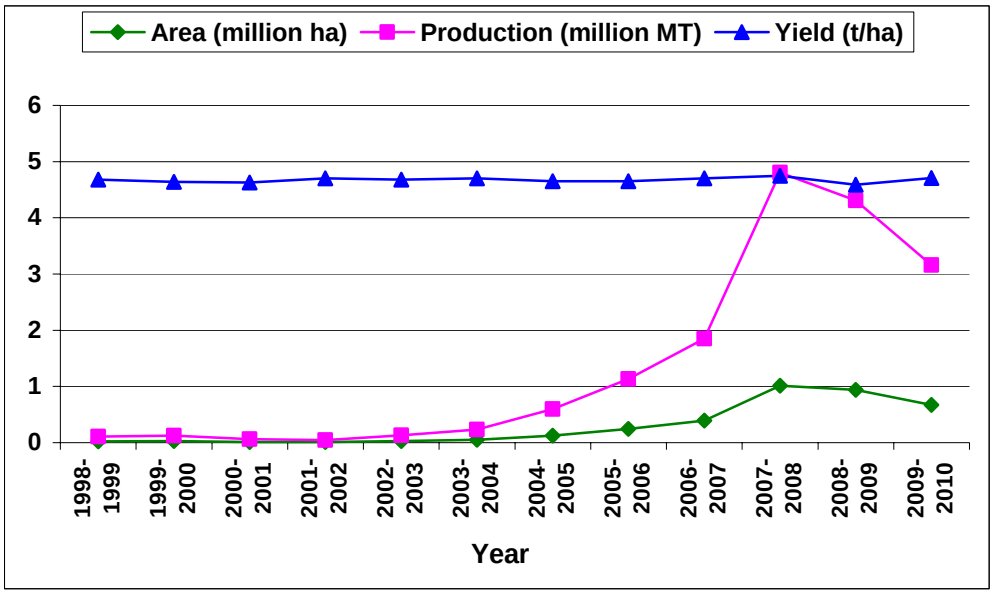

Figure.II: Area, production and yield of hybrid rice during 1998-2010

In addition to BRRI, BRAC (a large NGO) and one private seed company (Supreme Seed Company Ltd) have their own R & D for hybrid rice. BRAC initiated their hybrid rice R & D in collaboration with IRRI and sharing their germplasm. Through R & D program, BRAC developed two rice hybrid varieties, which have released by the National seed Board (NSB) for commercial cultivation in the country. A leading private company, Supreme Seed Company limited has its own research program for hybrid rice and developed two rice hybrids, which have released by NSB for commercial cultivation and seed production in the country. Currently 40 private seed companies are engaged in selling hybrid rice seed, only Supreme Seed Company has developed an R & D program. No significant investment was made by the private seed companies in R & D of hybrid rice except one private company (Supreme Seed Company limited) and one NGO (BRAC) have their own R & D for hybrid rice under their own funding

support. At present some private seed companies has initiated their own R & D program on hybrid rice and utilizing parental materials from BRRI, India and China and few of them have technical manpower. Most of the seed companies are importing hybrid seed from outside (mostly from China and few from India) and marketing through their existing seed dealers' network in the country. Several potential seed companies are producing hybrid rice seed in collaboration with the overseas seed companies (China and India).

Currently, hybrid rice accounts for about 22% of total Boro rice or 9% of the total rice area of Bangladesh in 2007-8. Hybrid rice produced about 26% of the total clean rice harvested in the Boro season, and about 15% of the total clean rice produced in 2007-8. During 1998-2010, a total of 16.57 million MT of clean rice was produced through cultivating hybrid rice on a cumulative total of 3.54 million ha. Hybrid rice accounted for a net increase in production of clean rice of about 3.88 million during 1998-2010, sufficient to feed approximately 23 million people for a year. The additional rice production of 3.88 million MT contributed US$ 1,406 million (BDT. 97,000 million) to GDP during 1999-2010. In addition, a total of about 13,503 MT of hybrid rice seed was produced in the country on 5,478 ha of land during 1999-2010. Domestic production of hybrid seed saved about US$ 34 million (BDT 2,436 million) of foreign exchange. Moreover, production of hybrid rice and hybrid rice seed generated a lot of rural employment in the country,

Private seed companies and NGO (BRAC) are the major agencies in hybrid rice seed marketing and BADC is the only agency from public sector for marketing hybrid rice seed in the country. Hybrid rice seed marketing agencies have been using various seed marketing approaches and strategies in collaboration with their appointed dealers and retailers from late 1990s. Currently more than 1000 marketing staffs are engaged directly and indirectly for selling with target at least about 10000 MT hybrid rice seed per year. Currently the highest market share is estimated for Supreme Seed (31.45%) followed by BRAC (18.02%), Lalteer (13.68%), Aftab (7.38%), Mollika seed (6.88%), others sellers (5.82%), EAL (5.61%), ACI (3.61%), United (2.97%), Ispahani (2.59%) and Metal (1.98%).

Production of hybrid rice seed in Bangladesh increased from 47.56 MT in 1999-2000 to 3,600 MT in 2009-10 Boro seasons. Hybrid rice seed production area increased from 52.63 ha in 1999-2000 to about 1,200 ha in the 2009-10 Boro season. Average hybrid rice seed yield increased about 233%, from 0.99 t/ha to 3.00 t/ha from 1999-2000 to 2009-10 Boro seasons. As of 2010, the highest recorded hybrid rice seed yield in Bangladesh is more than 4.0 t/ha, which can be compared to a maximum yield of less than 1.3 t/ha achieved in 1999-2000

Hybrid rice F_1 seed production plot

The key policy recommendations are proposed for hybrid rice technology development, introduction, large scale dissemination, the quality seed supply and marketing in the country. Among the policy recommendations, development of demand-led rice hybrid is prioritized as the highest followed by rice hybrid release guidelines, hybrid rice seed production, grain quality test, level playing field, seed quality monitoring, GOB paddy procurement and rice hybrid data

based. The existing seed related legal frameworks (Policy, Act, Rules and guidelines) of Bangladesh might need to be improved, modified, up-graded and amended in general for seed sector and in particular for demand-led hybrid rice technology development and its large scale dissemination in the country.

An in-depth field study could be undertaken to assess the performance of rice hybrids in the country on the basis of response from hybrid rice growers (farmers), seed producing farmers, seed dealers, seed entrepreneurs, consumers, traders and millers on routine basis in the country. The findings of the study will be useful for the policy makers, involved agencies (private/NGO and public) and all other relevant stakeholders for their better understanding and preparation of future work/business plan on hybrid rice in the country.

VII. Extension of fine and aromatic rice

Although the rice cultivation in Bangladesh is dominated by coarse and long slender rice, there is a substantial demand for fine and aromatic rice. During PETRRA project implementation, BRRI dhan 34 was found to be very promising. Accordingly, AAS has under taken its extension all over the country since 2005 T.Aman season. However, AAS distributed 150 Kg of Breeder and certified seed of BRRI dhan 34 among the 150 trained commercial farmers at 15 communities with 15 CBOs in Natore and Sirajgonj districts for its commercial cultivation and quality seed exchange among farmers. AAS will develop linkages between the fine and aromatic rice producing farmers and millers on the basis of profit for the both.

Farmer with BRRI dhan 34 production plot

VIII. Operating fish hatchery

AAS has been operating its fish hatchery at Alampur, Kushtia with trained fishermen on contractual agreement since 2000. Under such sub-contract system a total of 350 Kg quality hatchlings of following five different carps has been produced and distributed among the resource poor fish farmers and fisherman in Kushtia district during the reporting annual report period (Table.9).


Male (Above) and female (Below) Fishes for breeding

Table.9: Hatchlings production of five carps during 2010

SL	Carp type	Hatchlings (Kg)
1	Rohu	60
2	Mrigal	60
3	Catla	40
4	Silver Carp	70
5	Bata	120
Total		**350**

IX. Seed production and distribution

Quality seed production and distribution of various demand-led crops among the partner farmers an important activity of AAS since its inception. Relevant activities on seed production, processing, preservation and distribution of Onion and rice during the reporting period are presented below:

Onion: A total of 800 Kg quality seed of onion (Var. Taherpuri) was produced and stored in Natore during Annual reporting period for distribution in six chars of Lalmonirhat district during 2010-11 winter onion cultivation. Demand for such quality onion seed incarnated through field demonstration through partner NGOs of JOBS under the NOJ project funded by concern worldwide. Currently, Taherpuri onion is reported as a most high value crop at chars in Tista river of Lalmonirhat district. The quality seed supply chain of Onion (Var. Taherpuri) has developed in project chars of Lalmonirhat district.

Taherpuri Onion seed production plot

BRRI dhan 47: A total of 5000 Kg of foundation seed has produced and sold of BRRI dhan 47 as salt tolerant rice variety during 2010-11 Boro season in collaboration with private seed companies in Satkhira, Khulna and Bagerhat districts through 20 member NGOs of Oitijhya network in south west coastal region in the country.

BRRI dhan 47 seed production plot

Moreover, AAS developed contract farming system for seed production of rice and non-rice crops in southwest and northwest regions for the private sector seed selling agencies in the country. AAS has also developed F_1 rice hybrid seed production management system for private agencies. A draft practical manual on F_1 hybrid rice seed production has developed by AAS during last 2009-10 Boro season. Further, improvement will be done on the manual for distribution among the F_1 rice seed production agencies in Bangladesh. Moreover, demand-led long duration (sowing to harvest/processing) seed-men training on F_1 hybrid rice seed production can be arranged with funding support from donor agencies for the involved seed producing agencies.

X. Extension of Exotic fruit Orchard

AAS has been introducing exotic fruit orchards (e.g. Jujube, Litchi, Amropoly Mango etc) since 2005 through establishment of demo. orchard in collaboration with private nursery in Natore district. During the reporting period, AAS provided practical training on improved fruit orchard management including Jujube orchard establishment and management among more than 100 interested farmers and elite orchard owners in Natore, Pabna and Rajshahi districts, Training follow-up in field technical services provided by AAS horticulturists during jujube orchard establishment and post establishment management practices. AAS has been continuing research on Jujube such as Nut weevil of Jujube (Sphincticraerus (-Aubeus) sp.) and Tube Spittle Bug under the overall leadership of Dr. Z.H. Prodhan, Entomologist and scientific collaboration with CABI, UK. On the basis of findings, AAS published fact sheets in Bangali on Nut weevil of Jujube and Tube Spittle Bug for distribution among the owners of Jujube orchards in Natore, Pabna and Rajshahi districts.

Exotic Jujube demo. orchard (Var: Burmese)

Weevil infested Jujube fruit (Left), Weevil infested hole of Jujube (Middle) and Tube Spittle Bug on Branch of Jujube (Right)

XI. Uptake of high value crop varieties

AAS, from its earliest days, has focused most of its resources and energy on promoting high value crop production strategy in Bangladesh. The overall fertility of the land, the small plot size

Harvested Red Cabbage (Left) and Brocolli seedbed (Right)

and cultivation intensity; the easy availability of supplemental irrigation supplies all argue in favor of increased cultivation of high value cash crops in Bangladesh. Accordingly, wherever appropriate, AAS introduces new, high value cash crops and accompanying production packages. More than 90% of these available high value crop varieties and production packages have been demonstrated through AAS partner farmers/partner organizations. Of these, more than 50 crops and associated production packages have been accepted by farmers at the field level and have reached a high level of commercialized of production. The high value crop uptake process is participatory and is demand-led by the involved farmers. AAS has been continuing to introduce new varieties of high value cash crops with appropriate production packages in all of its project areas. AAS has demonstrated about 60 different new cash crop varieties from private seed companies during the reporting period in 3 working zones.

XII. Building capacity of partners

AAS has presented a series of agricultural training programmes for the benefit of more than 2000 staff of AAS and its partner organizations (NGOs & CBOs) along with relevant public & private sector organizations since its founding in 1989.

About 160 staff of AAS partner organizations (NGOs & CBOs) along with relevant public and private sector organizations received training from AAS during this reporting period. Chief executives and staff of POs, public and private sector organizations attended in various workshop, seminar, meeting, and field days etc on the relevant issues during this reporting period. Partner organizations participated in various trials, demonstrations, and studies during this reporting cycle. AAS has undertaken a series of training sessions and courses in several important areas including the following:

- ✓ Participatory training on FARMSEED method
- ✓ Improved seed technology for rice and non-rice
- ✓ Training on rice hybrid technology dissemination
- ✓ Orientation on uptake of high value crop varieties
- ✓ Orientation on Plant health services initiatives

- ✓ Intensive carps poly culture
- ✓ Introduction of In-field irrigation techniques
- ✓ Nursery establishment and management
- ✓ Strategy on establishment of exotic fruit orchard
- ✓ Yield maximization trial for rice in particular and non-rice crops in general

XIII. Developing skill and capacity of partner farmers

AAS has been using participatory training and motivational approaches to develop the skills and capacities of its partner farmers since it's founding in 1989. AAS conducted series of training and motivational activities under different projects to develop the skill and capacity of more than 800 farmers in its three working zones in the country during this reporting period. AAS provided practical training and orientation on several issues including the following areas to more than 800 farmers including resource poor farmers (RPFs); 30% of who were resource poor female farmers:

- ✓ Quality seed production through FARMSEED approach
- ✓ Improved production practices for hybrid rice
- ✓ Improved production practices for modern rice
- ✓ Improved production practices for rice and vegetable seed
- ✓ Improved production practices for Onion seed
- ✓ Practical training on rice yield maximization
- ✓ Safe and effective use of pesticide in crop production
- ✓ Intensive fingerlings production method
- ✓ Intensive carps polyculture in pond
- ✓ Production techniques for exotic crop varieties
- ✓ Intensive crop production in charland
- ✓ Nursery establishment and management
- ✓ Low cost irrigation system establishment and management
- ✓ Practical training on In-field irrigation technique

XIV. Formation of farmer groups

A total of 600 farmer groups have been formed with 14380 partner farmers in 73 upazilas of 24 districts in 3 working zones up to December 2009. These are all informal agricultural production/seed production groups and committed to create their own wealth using AAS's strategies on agriculture throughout the year. Total of 165 farmer groups with 4850 partner farmers were formed in 3 working zones during January-December 2010. Each farmer group has received various training courses and motivational activities since it formed at each community. The zone-wise total number of farmer group formed during the reporting period is given below:

Zone	# of farmers group	# of Partner farmers
North	40	1700
South	120	3000
East	5	150
Total	**165**	**4850**

XV. AAS Partner Organizations Network

AAS has historically implemented its rural based, agricultural productivity enhancing projects through its large network of rural based Partner Organizations (NGOs/CBOs). AAS has been strengthening and expanding its "partner NGO network" all over the country since 1989. At present about 100 NGOs directly and indirectly are involved with AAS partner NGO network. Presently, 60 NGOs are involved for implementing AAS developed intensified crop management strategies with their client resource poor farmers in 3 working zones. Presently a total of 170 AAS partner organizations (20 NGOs & 150 CBOs) are responsible for implementing IRRI/BMGF funding project on scale-up salt tolerant rice variety through FARMSEED in Khulna, Bagerhat and Satkhira districts. AAS has under taken an initiative to form a CBOs network with about 500 CBOs in southwest and south central coastal regions of the country for future project activities implementation.

XVI. Coastal agricultural production system

Recognizing the potentiality and benefits of coastal agricultural production system, AAS has taken initiative to introduce salt tolerant rice varieties in Southwest-South-central coastal regions and suitable non-rice crop varieties and progress in found significant.

Study conducted on existing salt tolerant crop varieties at CDSP protected chars in southeast coastal region in collaboration with PRISM, CDSP and IFAD. A crop menu developed with more than 50 crop varieties on farmers' demand-driven basis for scale-up in protected chars of southeast coastal region.

XVII. High value cash cropping in chars

Recognizing the potentiality and benefits of non-saline char agriculture, AAS has undertaken an initiative to introduce high value cash cropping in chars of Tista River in Lalmonirhat district through using participatory approaches and strategies under the funding support of JOBS since January 2007. During last three years, AAS demonstrated about 30 crop varieties, of which about 13 crop varieties have been accepted at very high level. They are potato (Var. Granola) Carrot (Var: New Kuroda), Onion (Var: Taherpuri), Sweet gourd (Var: Baromasi), Okra (Var: Anamika), Maize (6 hybrids), Ground nut (Var: Dac-1) and Country bean (Var: Local). Preliminary market linkages for the produced products have been development in Lalmonirhat districts. Accordingly, involved char dwellers income has increased due to cultivation and marketing of the high value cash crops in Lalmonirhat district. However, such high value cash cropping strategy need to be disseminated among the char dwellers within and outside of demonstrated chars in Lalmonirhat districts. Moreover, such high value cash cropping strategy can be uptake in other non-saline chars of the country.

XVIII. Contract farming system

Recognizing the potential and benefits of contract farming arrangements in the agriculture sector, AAS took the important initiative for developing contract farming system aim at promoting increased production of commercial crops in general and seed in specific along with fish and livestock productions and creation of marketing avenues for the farmers.

During last 10 years, AAS has developed contract farming model for seed production of inbreed and hybrid rice and non-rice crop varieties in Southwest and Northwest regions for private seed sectors.

XIX. Organizational Particulars

Year of Establishment: 1989

Chief Executive: Md. Harun-Ar-Rashid

Contact Person: Md. Harun-Ar-Rashid

Mailing Address

Head Office
Agricultural Advisory Society (AAS) House # 1/6 (Ground Floor), Block - G, Lalmatia, Dhaka-1207 Phone: 880-2-8113645 Mobile: 01712094218 E-mail: harunaas@gmail.com Web: www.aas-bd.org

Zonal Office	Area Office	
Northwest		
Agricultural Advisory Society (AAS) Mission Gate Bonpara, Boraigram Natore	Agricultural Advisory Society (AAS) College Road, Tarash Sirajganj	Agricultural Advisory Society (AAS) Ashutospur, Dipchar, Sadar, Pabna
	Agricultural Advisory Society (AAS) House # 19, Road # 1, C.S Road, Rangpur	Agricultural Advisory Society (AAS) Rangpur Road, Bangali Pur Saidpur, Nilphamari
	Niloy, Koigari, Gohail Road, Bogra-5800	
Southwest		
Agricultural Advisory Society (AAS) Adarsha Para, Sadar Jhenaidah	Agricultural Advisory Society (AAS) Abul Kashem Shorok, Sadar, Chuadanga	Agricultural Advisory Society (AAS) 1549 Mamun Para Road Khorki, Jessore
	Agricultural Advisory Society (AAS) House # 7, Road # 113, Khalispur Housing Estate, Khulna-9000	Agricultural Advisory Society (AAS) WAPDA Building Satla, Uzirpur, Barisal
Northeast		
Agricultural Advisory Society (AAS) Siraj Nagar (Fakir Bari) P.O: Narain Chara-3211 Srimangal, Moulvibazar	Agricultural Advisory Society (AAS) Motkhola Road, Pakundia Bazar Pakundia, Kishoreganj	Agricultural Advisory Society (AAS) College Road Jamalpur
	Agricultural Advisory Society (AAS) 18 Mohilla College Road Sadar, Habiganj-3300	Agricultural Advisory Society (AAS) House # 12, Road # 5, Noakhali House Estate Noakhali

Legal Status

AAS's Registration information:

Organization / Authority	Registration's #	Date
i) NGO Affairs Bureau	No. 1015	Date: 4.3.1996/04.03.2011 (renewed)
ii) Society Registration, Joint Stock Companies	No. 1379 (13) 91	Date: 5.2.1991
iii) Seed Wing, Ministry of Agriculture	SPMI/0432/2000	Date: 3.1.2000

Partnership Status with Forum

Sl. No.	Status	Forum	Address
1	Apex NGO (AAS)	AAS partner NGOs Network (100 partners NGOs)	House # 1/6, Block - G, Lalmatia, Dhaka-1207 Phone: 880-2-8113645, E-mail: harunaas@gmail.com Web: www.aas-bd.org
2	Member	Bangladesh Seed Grower Dealer & Merchants Association (BSGDMA)	145, Siddique Bazar (1st floor), Dhaka-1000 Phone: 880-2-9569677, 7112986 Fax: 880-2-956977, 9566196 E-mail: bsma@agnionline.com
3	Member/ Chairman	Bio-Village Forum (BVF) (50 members NGO forum)	House # 1/6, Block - G, Lalmatia, Dhaka-1207 Phone: 880-2-8113645, E-mail: harunaas@gmail.com Web: www.aas-bd.org
4	Member	Bangladesh Rice Foundation (BRF)	Flat No. B-1 (1st floor), House No. 7/5, Block-C, Lalmatia Dhaka-1207 E-mail: bsiddiqui04@yahoo.com
5	Member	Bangladesh Paribesh Andolon (BAPA)	9/12, Block-D, Lalmatia, Dhaka-1207 Tel: 8128024, 8113469 E-mail: bapa2000@gmail.com

Operational Areas

Working areas and involved PNGOs:

District	Name of Upazila	Nr. of Union	Nr. of Village	PNGOs (Nr.)
Zone-I: Southwest				
Satkhira	Kolarua, Sadar, Tala, Debhata, Kaliganj, Shamnagar, Ashashuni	25	70	9
Khulna	Fultola, Daulatpur, Sadar, Terokhada, Dumuria, Boitaghata, Dacop, Paikgacha, Koyra	20	61	7
Bagerhat	Sadar, Chitolmari, Fokirhat, Mollahat, Morolganj	15	50	5
Pirojpur	Motbaria	1	6	1
Chuadanga	Sadar, Damurhuda, Jibonnogar	6	30	5
Meherpur	Sadar, Gangi	4	25	3
Jhenaidah	Sadar, Kaligonj, Horinakunda	6	32	5
Jessore	Sadar, Bagherpara, Jhekorogacha	6	12	4
Magura	Sadar, Salikha	6	22	4
Kushtia	Sadar, Bharamara, Daulatpur	4	20	4
Barisal	Wazirpur,Banaripara	5	20	1
Zone-II: Northwest				
Gaibandha	Polashbari	2	6	3
Rangpur	Pirgonj, Kaunia, Sadar, Mithapukur	2	6	1
Thakurgoan	Sadar, Pirgonj	2	3	2
Sirajgonj	Tarash, Shahzadpur, Ullapara, Raiganj	17	57	8
Natore	Sadar, Gurudashpur, Boraigram, Singra, Lalpur	25	80	10
Pabna	Sadar, Atgharia, Ishurdi, Chatmohor	18	30	6
Rajshahi	Putia, Bagmara, Durgapur, Charghat	12	21	3
Bogra	Sadar, Shibhanj	3	6	2
Nilphamari	Saidpur, Sadar	4	12	4
Zone-III: Northeast				
Moulvibazar	Srimangal	5	10	4
Habiganj	Madhobpur, Chunarughat, Sadar	3	6	2
Kishoregonj	Pakundia, Kotiadi, Bajitpur	15	35	5
Jamalpur	Sadar	3	12	1
Noakhali	Sadar	2	10	1
25	**75**	**211**	**642**	**100**

AAS working areas and infrastructures: Since its inception, AAS has implemented a numerous projects to alleviate poverty among the resource poor and small farmers of Bangladesh. Thus AAS has been implementing its project activities at more than 642 villages in more than 211 unions under more than 75 upazilas of 25 working districts with about 100 partner NGOs in three working zones (Northeast, Northwest and Southwest) of the country. Since inception, AAS has been established offices and relevant infrastructures (Training centers, IT centre, fish hatchery etc) in the three working zones in collaboration with partner organizations to implement its project activities at the grassroots' levels.

Bankers

1. Arab Bangladesh Bank Limited, Dhanmondi Branch, Dhaka
2. Agrani Bank, Farmgate Branch, Dhaka

Collaborating and sponsoring agencies

1. USAID	2. PRIP	3. PACT	4. DSC
5. ASSP	6. DFID	7. CARE Bangladesh	8. IRRI
9. PETRRA	10. EU	11. CABI, UK	12. GROS, Belgium
13. BMGF	14. STRASA	15. IFAD	16. Rutgers University, USA
17. JOBS	18. EAL	19. PRICE	20. RDA
21. IFPRI	22. Mollika Seed Co.	23. PRISM Bangladesh	24. University of Wales, UK
25. PROVA	26. CIMMYT	27. RDC	28. Ispahani Bio-tech
29. BRRI	30. DAE	31. SAU, Dhaka	32. BAU, Mymensingh
33. BRF	34. CDSP	35. Seed Wing MoA	36. RDRS
37. BSMRAU	38. BADC	39. DLR	40. BARI
41. BINA	42. Northern University	43. BARC	44. Dept.of Fishery
45. Dept. of Forestry	46. Agro-Concern	47. Getco	48. Henslay, Dhaka
49. Sarker Eng. Works, Bogra	50. Bangladesh Flower Society	51. Rashid Agro	52. Siddiquis Seed
53. BMI	54. SEDF/IFC	55. Hortex Foundation	56. IDE Bangladesh
57. ABSP-II, USAID	58. Innovation	59. Crop Protection Association	60. Jamalpur Seed
61. KGF, Dhaka	62. Academy of Sci.	63. IPM CRSP	64. Metal Agro
65. World Concern	66. IBT	69. WRC, Dinajpur	70. TCRC, Dabiganj

The AAS Executive Committee (EC)

Name of Persons	Designation	Years of Term of Office	Occupation
Mr. Harun- Ar- Rashid	President	1991- till today	ED, AAS
Mr. Bazlur Rahman	Vice-President	September 2009- till today	Consultant, Hortex Foundation
Mr. Muktadir Ahmed	General Secretary	1995- till today	Proprietor, Brothers Polymar & Modern Pipe Industry
Mr. Khandoker Anisur Rahman	Assistant General Secretary	2004- till today	ED, PRISM Bangladesh
Mazibur Rahman	Treasurer	2010- till today	Proprietor, Jamalpur Seed
Md. Robiul Islam	Member	2010- till today	Associate Project Officer, UNFPA
Abdul Mannan Sarker	Member	1995- till today	Sector Development Advisor (SDA), PRICE

The AAS Advisory Board

Name of Persons	Designation	Occupation	Years of Term of Office
Dr. A. J. M. Azizul Islam	Director	Former DG BRRI	1996-till today
Prof. Dr. Shamsul Haque	Director	Vice Chancellor, Northern University	1996-till today
Carol M. Derrickson	Director	Educationist	1991- till today
William H. Derrenger	Director	Business Consultant	1991- till today
Md. Harun- Ar- Rashid	Director	Executive Director, AAS	1991- till today

AAS Partner NGO Network

AAS has historically implemented its rural based, agricultural productivity enhancing projects through its large network of rural based Partner Organizations (NGOs/CBOs). AAS has been strengthening and expanding its "partner NGO network" all over the country since 1989. At the beginning, a total of 23 national and international NGOs were involved with AAS partner NGO network during 1989-90 under funding support from USAID. At present about 100 NGOs directly and indirectly are involved with AAS partner NGO network. Moreover, 125 NGOs are involved for implementing AAS developed intensified crop management strategies with their client resource poor farmers in 3 working zones during 2004-2009. A total of 125 AAS partner organizations (NGOs and CBOs) were responsible for implementing PETRRA funded thirteen sub-projects/activities in 62 upazilas of Moulvibazar, Habiganj, Sylhet, Sunamganj, Rajshahi, Chapai Nawabganj, Natore, Pabna, Sirajganj, Bogra, Naogaon, Jessore, Jhenaidah, Kushtia, Magura, Rajbari, Faridpur, Gopalganj, Mymensingh, Jamalpur, Gaibandha districts under the umbrella network of AAS. A total of 91 partner organizations received training on sustainable FARMSEED strategy for its implementation with their partner resource poor farmers in three working zones. Total of 36 AAS partner NGOs have been developed for a partnership network all over the country in 3 working zones for extension of intensive carp poly-culture fish fingerling production and distribution under donor support. Total of 22 member NGOs of Oitijhya network have been developed in Satkhira, Khulna, Bagerhat and Pirojpur districts of southwest coastal region for scale-up salt tolerant rice variety through FARMSEED since 2008.

One of AAS's great strengths is that it is able to work through a large network of experienced grassroots partner organizations. Large number of the skilled staffs established relevant infrastructures and sufficient micro-credit of the members of AAS partner NGO Network are the foundation strength of AAS to implement the suitable project activities on the cost-effective basis. Accordingly, AAS, being a relatively small organization itself, is able to cast a very big shadow over a large area. AAS could have such an impact on the basis of its own resources alone. Rural youth groups, women groups, CBOs and local NGOs representing diverse rural constituencies are all part of the AAS-Partnership Network. Accordingly, AAS gains strength from its network partners. On the other hand, AAS maintains close and collegial relationships with a large number of public sector and international organizations that have solid agri-technical credentials. These include IRRI, BRRI, BARI, BARC, BADC, DAE, BARD, CIMMYT, FAO, CABI, Rutgers University, JOBS, BMGF, IFAD, GROS, DFID, EU, RDA, IFPRI and others with whom AAS maintains and sustains long-term collaborative relationships.

Staff strength

Besides its permanent staff, AAS employs from the enlisted personnel as per the requirements of its individual projects. Moreover, AAS also utilizes personnel on a voluntary basis and part time basis from its enlisted staff list. The personnel of AAS are posted at district, upazila, union and village levels to work in close contact with its client farmers, the resource poor.

AAS has a total of 48 staff, of which 21 permanent and 27 part time and volunteer staff for implementing its program activities in 28 districts. Among the 27 part time staff, 8 consultants and 1 advisor, as well as volunteer and seasonal staff. Out of 48 enlisted staff, 36 staff are technical staff, specialized in Agriculture, Irrigation and water management, Environment, Seed technology, Aquaculture, Business Management, BDS, VC, SC etc. AAS personal are all experienced, highly qualified professionals in their own field, who contribute to the success of its projects and the development of Bangladesh's agricultural capacity. The AAS staff is fully committed to building the skill and technical capacity of poor farmers; to create wealth for them in order to improve their livelihoods. Our dedicated staffs play a key role in this and the list of staff of AAS are provided in the following Table:

Table: List of staff (Full time, Part time/ Volunteer, Consultant & Advisor)

Sl. No.	Name	Designation	Qualification	Full Time	Part Time[1]
1	Md. Harun-Ar-Rashid	Executive Director	MS (Ag)	✓	
2	Mr. Bazlur Rahman	Consultant, Value Chain	MS (Ag)		✓
3	Mrs. Azima Sultana	Admin. Officer	M.A.	✓	
4	Mr. Ziaur Rahman	Finance Manager	M.Com (A/C)	✓	
5	Dr. M. Nasir Uddin	Consultant, Seed & Research	Ph.D		✓
6	Dr. Tariful Islam	Consultant, Environment	Ph.D		✓
7	Dr. Humayun Kabir	Consultant, Climate Change	Ph.D		✓
8	Dr. Jalal Uddin Iqbal	Advisor-Health	MBBS		✓
9	Kbd. Rakibul Islam	Zonal Coordinator, South	B.Sc. Ag (Hons)	✓	
10	S.M. Mobarok Hossain	Irrigation Engineer	B.Sc Ag (Eng)		✓
11	Ratan Kumar Bhowmik	Agronomist	M.Sc.Ag (Marketing)		✓
12	Kamrul Hassan	Seed Technologist	MS (Ag)		✓
13	K.M. Alauddin	Fishery Specialist	M.Sc (Fishery)	✓	
14	Md. Sydur Rahman	Irrigation Specialist	B.Sc.Eng (Agri.)		✓
15	Shaiful Ahsan Kabir	Seed Agronomist	MS (Ag)		✓
16	Md. Mohafez Ali	Consultant, Food Security	M.Sc.Ag	✓	
17	Khandaker Aminul Kabir	Zonal Coordinator	M.Sc (Chemistry)	✓	
18	Alok Kumar Biswas	Entomologist	MS (Entomologist)	✓	
19	Kbd. AKM. Rabiul Islam	Consultant, Poultry	MS (AH), MBA		✓
20	Shahedur Rahman Syem	Horticulturist (Nursery)	MS (Ag)		✓
21	AHM Asadur Rahman	Plant Pathologist	Ph.D	✓	
22	Mostafa Kamal	Field Officer (Seed)	Diploma (Ag)		✓
23	Nurun Nabi	Field Officer (Ag)	BS		✓
24	Dr. Rathi Mahamud Morshed	Zonal Coordinator	Ph.D		✓
25	Aminul Islam	Horticulturist	MS (Ag)	✓	
26	Md. Ashraful Alam	Finance Officer	MBA	✓	
27	Md. Rezaul Islam	Field Coordinator	BS		✓
28	Shihab Uddin	Agronomist	B.Sc. Ag (Hons)		✓
29	Md. Mazharul Islam Bhuiyan	Agronomist	B.Sc.Ag		✓
30	Md. Sajidul Islam	Coordinator	MSS (Sociology)	✓	
31	Md. Masud Karim	Agronomist	M.S in Agro forestry	✓	
32	Md. Shohagh Parvez	Area Coordinator	MSS		✓
33	Md. Nazrul Islam	Area Coordinator	Diploma in Agricultural		✓
34	Md. Babul Aktar	Field Coordinator	Diploma in Agricultural	✓	

[1] Volunteer

Sl. No.	Name	Designation	Qualification	Full Time	Part Time[1]
35	Swaran Jit Ray	Field Coordinator	Diploma in Agricultural	✓	
36	Md. Moinuddin Ahamed	Area Coordinator	H.S.C	✓	
37	Subrota Kumar Ghos	Field Coordinator	H.S.C	✓	
38	Md. Anowar Hossain	Field Coordinator	H.S.C	✓	
39	Md. Abdus Salam Monju	Field Coordinator	H.S.C	✓	
40	Md. Ibrahim Hossain	Computer Operator	S.S.C	✓	
41	Md. Mosharaf Hossain	Field Coordinator	S.S.C		✓
42	Md. Elias Hossain	Field Coordinator	S.S.C		✓
43	Abdul Malek	Caretaker	S.S.C	✓	
44	Dr. M. Eusuf Harun	Consultant	Ph.D		✓
45	Dr. Md. Abdul Baset	Consultant	Ph.D		✓
46	Meer Md. Muniruzzaman	Consultant	MS		✓
47	Asma Parvin Happy	Agronomist	B.Sc Ag		✓
48	Mohammad Kamal Chowdhury	Agronomist	MS		✓
49	Md. Moniruzzaman	Horticulturist	MS		✓

Financial status, experience and management

The financial transactions are maintained following the international accounting standards and rules of the government of Bangladesh. An annual audit is conducted at the close of every calendar year by the reputed audit firm.

The internal audit team periodically checks the financial transactions and justifies the utilization of fund and report to the Executive Director. The accounts and finance personnel control the fund utilization according to the budget and physical output. The external audit team of registered audit firm usually checks the books of accounts and records and report to the CEO. The Executive Committee, the Advisory Board and the General Committee of AAS approve the financial Audit report. Nine years audited revenue income and expenditures of AAS are in the following Table:

Table: Nine years audited revenue income and expenditures of AAS

Activity/Project	Year	Revenue Income (Taka)	Expenditures (Taka)
Agricultural Advisory Society (AAS)	31-Dec-02	3854943.00	4022871.00
Agricultural Advisory Society (AAS)	31-Dec-03	5504552.00	5482197.00
Agricultural Advisory Society (AAS)	31-Dec-04	5739722.00	5718981.00
Agricultural Advisory Society (AAS)	31-Dec-05	1296708.00	1706508.00
Agricultural Advisory Society (AAS)	31-Dec-06	1225375.00	1579560.00
Agricultural Advisory Society (AAS)	31-Dec-07	655421.00	1061753.00
Agricultural Advisory Society (AAS)	31-Dec-08	745263.00	1125911.00
Agricultural Advisory Society (AAS)	31-Dec-09	2315590.00	2189522.00
Agricultural Advisory Society (AAS)	31-Dec-10	2,403,864	3,459,541
		2,37,41,438	**2,63,46,844**

Management of AAS

The Executive Committee headed by the president of the society does the project Activities of AAS and policy planning. The Executive Committee is elected/approved by the General Committee. The Executive Director of AAS implements the projects and programs through AAS staff and its partner organizations in the working areas. The Executive Director carries out the activities of AAS with the assistance of a group of professionals appointed by him and approved by the Executive Committee. The Executive Director is accountable to the Executive Committee, General Committee and Advisory board of the AAS. The hierarchy is strictly maintained according to the organogram of the organization. The plan of activities is implemented according to the guideline of the organization through the field personnel and assures the best quality of outputs.

Monitoring, Evaluation and Reporting

The input and output is continuously monitored by the program personnel and evaluated according to the result oriented monitoring indicators (ROMI). The sponsors according to their guidelines also evaluate the outputs. Moreover, the donor-funded projects are monitored and evaluated on basis of agreed indicators at Goal, Purpose, Outputs and Activities levels of the logical framework of the projects. The monitoring and evaluation of the projects are implemented through using participatory approach. The monitoring and evaluation team is ensured, the participation of the primary beneficiaries during monitoring and evaluation of the progress and impact of the projects.

The monitoring, evaluation and reporting requirements for AAS's program initiatives are always carefully specified in each project's contract documentation and are usually based on the log frame that defines the level of resources being committed to each project and the expected, verifiable outcome of the project. Accordingly, AAS is accustomed to doing its work in the context of the customary, international standards of Monitoring, Evaluation and Reporting that are currently prevailing in the multi-national donor community.

In this regard, AAS is known to rigorously follow the Monitoring/Evaluation and Reporting requirements specified by each of its donor sponsors. Generally speaking, there is a brief inception/need assessment or benchmark survey report which describes the beneficiaries to be served; the work to be done, the resources being committed to the work, the specific work sites and activities to be undertaken during the course of the project (Work plan/Time Line). Consideration is given here to areas where problems may be encountered how these might be mitigated and also to whether subsequent phases of the project are contemplated. Finally, the initial report sets out the agenda of clearly defined; achievable and objectively verifiable project result/outputs to which AAS is committed.

With this as the backdrop, AAS normally provides its sponsoring funding agencies with quarterly progress reports that compare its projected results with the actual results achieved for each reporting period. AAS is accustomed to providing its donor sponsors with an externally prepared Certified Financial Report on an annual basis. At mid-term in each project (usually annually) AAS is accustomed to submitting its fourth quarter report as an internal evaluation report, which summarizes the project's achievements to date; detailing its successes and failures. In addition, AAS is accustomed to giving its full cooperation to a mid-term or end of phase external evaluation which is initiated/scheduled and funded by the sponsoring donor.

However, above mentioned principles for monitoring, evaluation and reporting are followed on the basis fund availability and type of donors.

AAS Publications

- Banana Production Manual, 1989.
- Continuous Cropping System with Irrigation Manual, 1990.
- Irrigated Diversified Cropping Manual, 1990.
- Intensive Duckweed Production Manual, 1993.
- Intensive Pond Pisciculture Manual, 1992.
- Cost and Economic Return Analysis of Different Crops with High Inputs Practices and Irrigation under Demonstration and Farmers Improve Management Practices, 1991. 1994, 1998 and 1999.
- Proceedings on Irrigated Intensive Cropping System Demonstration in Char Land, 1991.
- Fish Seed Production Farm Management Manual, 1993.
- Zinc and its Management in Crop Production, 1996.
- Boron and its Management in Crop Production, 1996.
- Small Scale Poultry Farming Manual, 1996.
- In-Field Irrigation Technique Manual, 1990.
- Seed Production Manual, 1991.
- Nursery and Orchard Establishment and Management Manual, 1989.
- Homestead Agricultural Production Management, 1990.
- Arsenic Hazard Abatement Manual, 1997.
- Intensive Crop Production Management Manual, 1998.
- Proceedings of the Workshop on Arsenic in the Food Chain: Assessment of Arsenic in the Water-Soil-Crop Systems, 2004
- Family approach in extension. In Innovations in Rural Extension: Case study from Bangladesh, 2005
- Village soil fertility maps. In Innovations in Rural Extension: Case study from Bangladesh, 2005
- FARMSEED: putting farmers at the heart of the seed system. Innovations in Rural Extension: Case study from Bangladesh, 2005

- Breaking down barriers: village women spread the word. In Innovations in Rural Extension: Case study from Bangladesh, 2005
- Performance of 22 Cultivars of FAG rice in Srimangal and Sadar Upazilas of Moulvibazar district, 2002 T. Aman Season
- Performance of 7 Cultivars of FAG Rice in Srimangal and Sadar Upazilas of Moulvibazar District, 2002-3 Boro Season
- Performance of 28 Cultivars of FAG Rice in Moulvibazar and Habiganj Districts**,** 2003 T. Aman Season
- Performance of 7 Cultivars of FAG Rice in Moulvibazar and Habiganj Districts, 2003-4 Boro Season
- Proceedings of Benchmark Survey: Plant Health Problem of Rice: Earthworm (*Chera*) 2003-04 Boro Season
- Report on Participatory Qualitative Survey on Plant Health Problems, Season: Summer-I, 2004
- Report on Participatory Qualitative Survey on Plant Health Problems, Season: Summer-II, 2004
- Report on Participatory Qualitative Survey on Plant Health Problems, Season: Winter, 2004
- Brief description of farmer innovative method (FIM) for plant health management
- Summarized Survey of Local Plant Health Knowledge, 2005
- Food Security for Sustainable Household Livelihoods (FoSHoL) Project, 1 December 2004 - 31 May 2005: Summary
- Performance of Six Rice Hybrids Under Bangladesh Conditions, 2003-04 Boro Season
- Prospects and Potentials of Rice Hybrids in Bangladesh, 2004
- Performance of Rice Hybrids Under Bangladesh Conditions, 1998-99 Boro Season
- Participatory Integrated Plant Nutrient Management in Intensive Rice-based cropping, Seasonal Report of Aus 2002
- Participatory Integrated Plant Nutrient Management in Intensive Rice-based cropping, Seasonal Report of T. Aman 2002
- Report on Specific rice knowledge need assessment for BRKB content (Northeast region), August 2004
- Interim Technical Report: Experimentation on ways of using the Bangladesh Rice Knowledge Bank (BRKB): 15 February 2007
- Report on Pilot testing of Bangladesh Rice Knowledge Bank (BRKB) with farmers and secondary stakeholders (Northeast region), June 2005

- Final Technical Report: Experimentation on ways of using the Bangladesh Rice Knowledge Bank (BRKB), 06 August 2007
- Selected Technological Materials for Food Security for Sustainable Households Livelihood (FoSHoL) Project, 2005
- Documented Technological Materials for Food Security for Sustainable Households Livelihood (FoSHoL) Project, 2005
- Proceedings: Introductory-planning Workshop on Technology identification and documenting for knowledge Bank for FoSHoL project: 15 December 2004
- Proceedings of the workshop on Identification and Recommendation of Location Specific Rice Technologies for FoSHoL Project (BRRI, Gazipur): 9 January 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Sunamganj District): 12 January 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Satkhira and Khulna districts): 18 January 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Faridpur, Rajbari, Madaripur & Shariyatpur districts): 9 February 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Jamalpur district): 24 February 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Gazipur district): 9 March 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Bogra district): 17 March 2005
- Proceedings of the participatory workshop on Technology Identification and Recommendation for FoSHoL Project (Noakhali district): 6 April 2005
- Narrative Progress Report: Scale-up salt tolerant rice variety through FARMSEED: 1 June 2008-30 April 2009
- Narrative Progress Report: Scale-up salt tolerant rice variety through FARMSEED: 1 May 2009-October 2009
- Good Seed Initiative (GSI) in South Asia, Survey Report: Knowledge, Attitude and Practice (KAP) On Rice Seed Post Harvest Practices, 31 January 2006
- Survey Report: Assessment of Farmers' Need for Vegetable Seed Information, 25 January 2007
- Survey Report: Assessment on Additional Impact of Video Show on Rice Seed Post Harvest Practices, 6 February 2007

- Uptake Pathway Research Report: Uptake Pathways for dissemination of rice post harvest practices, April 2007
- Survey Report: Impact of video show on rice seed post harvest practices, 19 July 2007
- Private Innovation and R&D in Bangladesh Agriculture: Description, Impact, and Policy Options, 1 October 2009
- Use of Farmers' Empirical Knowledge to Delineate Soil Fertility-Management Zones and Improved Nutrient-Management for Lowland Rice: 6 February 2008
- International Plant Nutrition Colloquium (University of California, Davis): An evaluation of nutritional constraints on irrigated rice yield, Year 2009 Paper 1083
- Guidelines for Vegetable Seed Production 2008
- A Special Study on Poly Shed Summer Tomato: Adoption and farmers' innovations, November 2008
- Completion Report on Skilled family member extension approach for rice knowledge adoption, June 2004
- Training Report on Skilled family member extension approach for rice knowledge adoption, June 2004
- Completion Report on Women Led Group Extension Method for rice and rice seed drying and storage technology, June 2004
- Completion Report on Strengthening FARMSEED (farmer to farmer seed exchange System) Extension Method, June 2004
- Zinc and it's management in crop production, January 1996
- Boron and it's management in crop production, December 1995
- Proceeding on Technology Development Workshop, 23-24, May 2004
- Proceeding on National Uptake Workshop, 17-18, April 2004
- Village Soil Fertility Maps: IRRI 2005
- Narrative Progress Report: Scale-up salt tolerant rice variety through FARMSEED (Farmer-to-farmer seed exchange system): 1 June 2008-30 April 2009
- Narrative Progress Report: Scale-up salt tolerant rice variety through FARMSEED (Farmer-to-farmer seed exchange system): 1 May 2009-31 October 2009
- Use of Farmers' Empirical Knowledge to Delineate Soil Fertility-Management Zones and Improved Nutrient-Management for Lowland Rice
- Issues in Food Prices Determination in Bangladesh: February 2009
- Cost and Return Analysis: Selected crops and their varieties 2006-2007 and 2007-2008 Cropping Seasons

- Impact Study: CABI-WRC Wheat seed activities for the Good Seed Initiative in Bangladesh: 31 October 2010

AAS's Resources

SL #	Item	No
1	Head Office (Rented)	1
2	Zonal Office (Rented)	3
3	Area Office (Rented)	3
4	Area Office (Sharing with PNGOs)	10
5	Training Center (Rented)	1
6	IT Center (Dhaka)	1
7	Fish Hatchery (Rent out)	1
8	Computers (Sets)	10
9	Laptop	2
10	Multimedia	2
11	AC	4
12	IPS	5
13	Vehicles (Members-EC/Board)	2
14	Motor Cycles	5
15	By Cycles	5
16	Tables (All)	25
17	Chairs (All)	120
18	Moisture Meter (All)	5
19	Digital Camera	3
20	Generator	1
21	Fans (All)	30
22	Telephone	3
23	Steel Almirah etc	12
24	Balance Normal	5
25	Electronic Scale (in grams)	1
26	Sealing Machine (All)	10

List of current referees

The following list of current clients who can confirm AAS's competency in the designated areas:

List of current or former referees

Dr. Noel P. Magor Head, Training Center International Rice Research Institute (IRRI) Los Baños, Laguna, Philippines E-mail: N.Magor@cgiar.org	Dr. Paul Van Mele Director, AGRO Insight Fuchsiastraat 112 9000 Ghent, Belgium E-mail: paul@agroinsight.com
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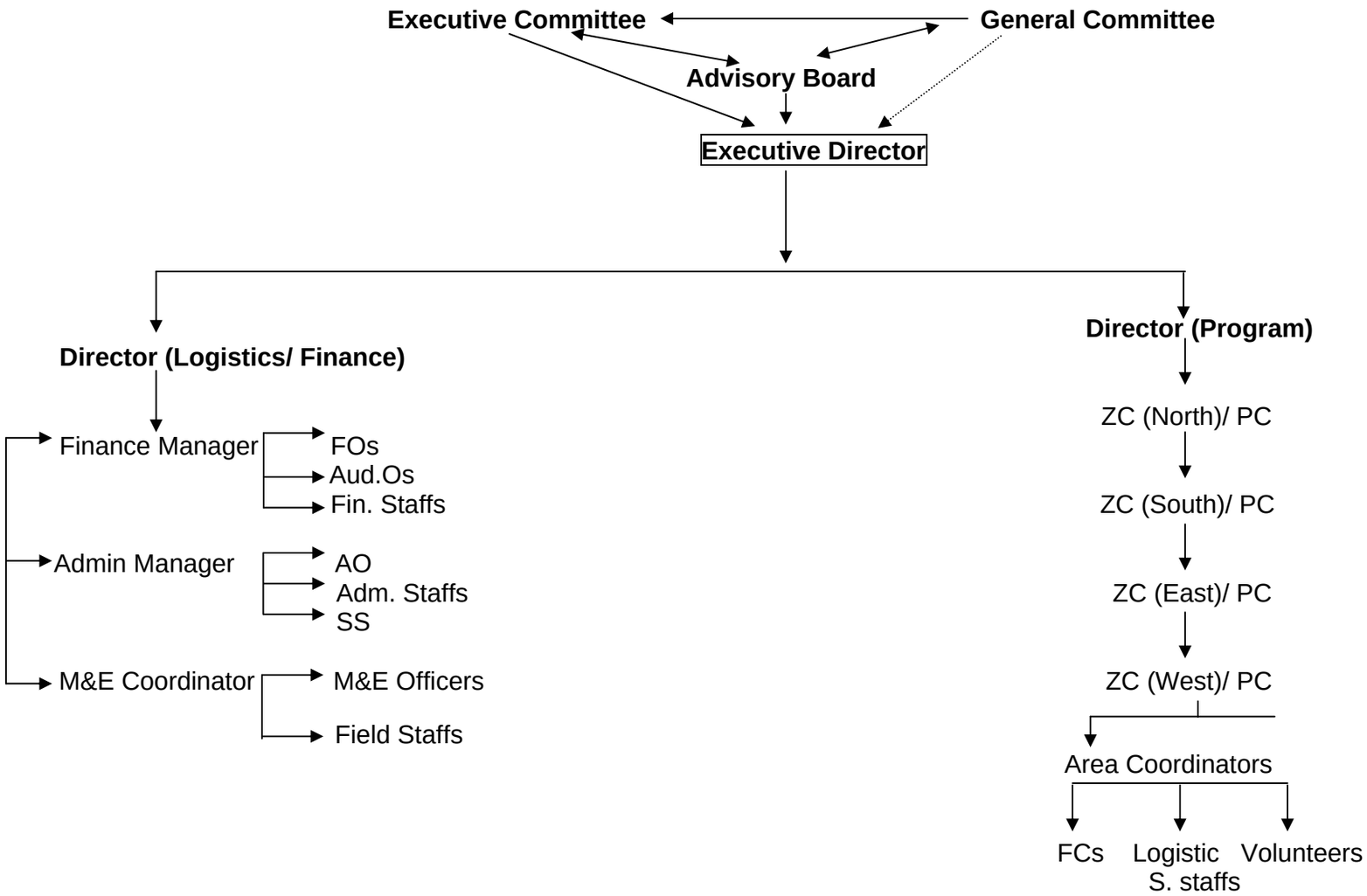

Brinjal: Shoot and Fruit Borer

Scientific Name: *Leucinodes orbonalis* Guenee

Insect characters

- The adult is a white moth having brown or black spots on thorax and abdomen. Forewings bear black, pale and light brown spots.
- At initial stage larva is pale white but later it turns into bright pink color. Larva is brown headed and 15-23 mm long.

Nature of damage

- The larval stage is the only destructive stage.
- In the early stages, the larvae bore into tender shoots as a result the infested shoots droop down and ultimately dries up.
- Later on the larvae bore into the flower buds and feed on them. The fruiting capacity of the plant is reduced significantly.
- Larvae prefer fruits than other plant parts. They bore into the young fruits near the petiole and feed internal tissue.

- The inside of the fruit became hollow and filled with excreta. The severely infested fruits are rendered totally unfit for human consumption.

Life cycle

- The insect has four stages of its life cycle-such as Egg, Larva, Pupa and Adult
- The female lay 100-250 eggs singly or in cluster of 2-4 eggs on both sides of leaves, green stem, shoots, flower buds, at leaf petiote and on young fruits.
- The egg stage lasts 4-5 days. Upon hatching, the larva search for food and bore into tender shoots near the growing point, into flower buds and into the fruits. The larval stage lasts 15-20 days.
- Pupation occurs in crop debris or in soil at depth of 1-2 cm and the pupal stage lasts 6-17 days depending upon temperature.
- Longevity of adult is 2-3 days for male and 2-4 days for female.

Management

- Removal of fallen leaves and debries from the field.
- Removal of brinjal stubble of old plantings around the field.
- Collect the infested flowers, shoots and fruits with sharp knife and destruction of larvae.
- Catch and destroy male adults by using sex pheromone bait trap.
- Cultivation resistant varieties like BL-009, BL-114 and ISD-006
- Indiscriminate and overuse of insecticide should be stopped for allowing natural multiplication of the natural enemies (e.g. *Trathala flavo-orbitalis*) of the pest.
- In case of heavy infestation the following insecticides may be sprayed judiciously:
  - ✓ Cypermethrin (Ripcord 10 EC, Cymbush 10 EC, Fenom 10EC) 1 ml/L of water or Fenvalarate (Sumicidin 20 EC, Fentox 20 EC, Fenfen 20 EC) 0.5 ml/L of water or Cartap (Santap 50 SP, Padan 50 SP) 2.4 g/L of water.
  - ☞ The fruits should be harvested before spraying and should not be harvested for at least 15 days after spray:

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