




Research Progress 2007 – 2008



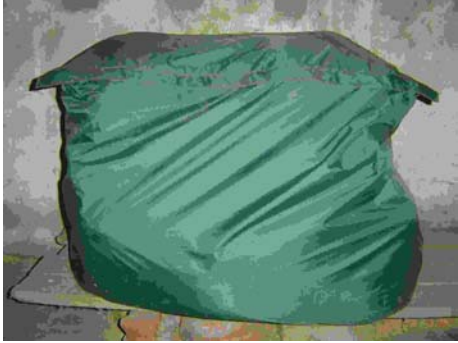
Sl. No	Research Progress	Expected Output
I: Program Area: Varietal Development		
1.	<p>Genetic improvement of Upland rice Back cross breeding is initiated to combine drought tolerance and short duration for upland (Aus) rice.</p>	Generation of segregating population.
2.	<p>Genetic Improvement of Transplant Aus Rice National Technical committee has recommended to release BR5563-3-3-4-1 as BRRRI dhan48 for T Aus season.</p>	Supplementary variety to BRRRI dhan26 with non-sticky cook rice and yield potential similar to BR26.
3.	<p>Genetic Improvement of shallow flooded Deepwater Rice. Crossing between sub1 line and slow elongating line of shallow flooded deep water ecosystem.</p>	Started the development of breeding materials for shallow flooded environment (1m depth).
4.	<p>Breeding for rainfed low land rice (RLR)</p> <ul style="list-style-type: none"> • BR6592-4-6-4 has been approved by the National Technical Committee to release as BRRRI dhan49. • Developed NILs and RILs of Swarna. • Improved lines with Kataribhog grain type were advanced. 	<ul style="list-style-type: none"> • Lodging tolerant and high yield potential variety similar to BR11 but one week earlier than BR11 and grain type similar to Nizersail. • Identification lines better than Swarna. • High yield potential lines with Kataribhog grain type.
5.	<p>Breeding for flash flood submergence tolerance</p> <ul style="list-style-type: none"> • BR11 <i>sub1</i> lines have been successfully developed. • Seeds of Swarna <i>sub1</i>, IR64 <i>sub1</i> and Sumba <i>sub1</i> were received from IRRI. 	Advance lines with submergence to tolerance are available for evaluation at flash flood prone environment.
6.	<p>Breeding rice for salt tolerance</p> <p>MAB is adopted for the salt tolerant rice breeding confirming <i>Sal tol</i>.</p>	Promising materials were developed with <i>Sal tol</i> using BRRRI dhan28 and BR11.
7.	<p>Breeding for cold tolerance Evaluation of genotypes from cold countries (Colombia, Brazil, Russia, China, Korea and Japan) at haor area of Sunamganj. Five genotypes were identified with flowering dates similar to Hbj. B. IV and VI without awn and good plant type.</p>	Cold tolerant donors identified.


8.	<p>Development of premium quality rice Field evaluation by NSB completed for the proposed line BR6902-16-5-1-1. The line has grain size similar to basmati rice and called Banglamati.</p> 	<p>Development of export quality rice for release as variety.</p> 
9.	<p>Breeding for micronutrient dense rice BR7517-2R-2-1 and BR7517-2R-4-1 were developed with Fe (5.0-6.0 mg/kg) and >25 mg/kg Zn content in polish rice.</p>	<p>Development of high yielding genotypes along with high Fe and Zn content for improving the nutritional quality of rice.</p>
10.	<p>Physicochemical and cooking properties of grain Grain properties of 200 breeding lines were evaluated. It includes length, breadth, shape and size, milling properties, amylose content (%), protein content (%), elongation ratio and aroma.</p>	<p>Isolation of breeding lines with standard physicochemical and cooking properties.</p>
11.	<p>Nutritional quality assessment of rice BR23 and BRRIdhan40 were identified as high lysine varieties. BR3, BR11, BR16, BR23, BR32 and BRRIdhan41 were identified for slow digestible starch varieties.</p>	<p>Identification of BRRi varieties with nutritional quality.</p>
12.	<p>Preparation of puffed rice BR23 is identified as excellent variety for quality mooree (puffed rice) production.</p> 	<p>Superior quality puffed rice for the consumers.</p>
13.	<p>Molecular characterization</p> <ul style="list-style-type: none"> • Thirty-four BRRi varieties have been screened against 79 SSR markers and 10 draft identity cards have been prepared. • Initiate gene pyramiding for BB and blast diseases. 	<p>BRRi varieties will be protected in respected to IPR through DNA markers.</p> <p>Varieties resistant to bacterial blight and blast will be developed.</p>





14.	Germplasm conservation and characterization <ul style="list-style-type: none"> • 320 germplasm have been collected. 921 rejuvenated and 1565 characterized with 45 morpho-agronomic characters. • 1000 germplasm accessions were documented in computer database with available information. 	Enrichment of rice gene bank with new germplasm and availability of gene sources for rice variety improvement.
15.	Seed production and maintenance <ul style="list-style-type: none"> • 45.7 tons of Breeder seeds were distributed • 48.3 tons of BS were produced. 	Sustainable quality seed production and supply to seed growers.
16.	Hybrid Rice <ul style="list-style-type: none"> • 175 (Ax R) crosses were done using 11 CMS lines. • BC5, BC4 and BC2 populations have been development. • Seven experimental hybrids were evaluated. 	<ul style="list-style-type: none"> • Process to develop new hybrid rice. • Process of developing parental maturity. • Identification rice hybrid for T. Aman season.
II: Crop Soil Water Management Program (CSWMP) Area		
17.	Evaluation of candidate herbicides. Ten new herbicides found effective to control weeds.	Recommendation of new herbicide for efficient weed control and reduce cost of crop management.
18.	Groundwater water quality assessment. <ul style="list-style-type: none"> • Gazipur, Rajshahi, Comilla and Habiganj are suitable for DTW. • Bhanga, Rangpur and Sonagazi are suitable for STW. 	Assessment of water quality for safe irrigation.
19.	Water Distribution System Improvement <ul style="list-style-type: none"> • Field demonstration of check valve in STW • Five check valves were installed. • Easy start of STW. 	Reduce human drudgery for starting of STW.
20.	Piloting of Alternate Wetting and Drying (AWD). Demonstration was conducted at Feni, Kustia and Rangpur.	Saving 20-25% irrigation water without hampering yield.
21.	Screening for abiotic stress tolerant <ul style="list-style-type: none"> • Salt tolerant (10) at 10-12 dS/m. • Submergence tolerant (6) at 10-12 days of submergence. 	Identification of salt and submergence tolerant genotypes for varietal improvement.
22.	Properties of non-saline tidal sediments <ul style="list-style-type: none"> • Contains 13% sand, 36% silt, 51% clay. 1.95 % organic C, 676 ppm water soluble C, 0.13 meq/100g water soluble K, 0.36 meq/100 g exch. K, 1% total K, 763 mg/kg total P. • Buffering capacity of K in tidal sediment was 28.63, which was slightly lower than tide-free soil. 	Tidal flooded soil contains nutrients that improve soil properties.





III: Pest Management Program Area		
23.	<p>Crop establishment in submergence prone environment</p> <ul style="list-style-type: none"> • >30 day old seedlings showed >90% survival over younger seedlings. • Seedlings raised in dry bed condition@ 10-12 g/m²) were taller (30-42 cm) then wet bed method (18-28 cm). • Double transplanting is the best bet crop establishment technique of farmers for submergence prone areas. 	Recommendations for rice crop establishment methods for submergence prone environments.
24.	<p>Survey & monitoring of rice diseases</p> <p>Survey was conducted at Feni, Comilla, Rajshahi, Comilla and Gazipur. Sheath blight (ShB), Bacterial blight (BB) and Bacterial leaf streak (BLS) was recorded as major diseases. BLS has emerged as a major threat in hybrid rice.</p>	To generate database on rice diseases in respect to variety, cropping pattern, season and, location to develop forecasting models.
25.	<p>Disease resistance and molecular studies</p> <ul style="list-style-type: none"> • Cultural characterization of 71 <i>F. moniliformae</i> isolates and molecular characterization of 60 isolates using DNA markers have been done. • Three isolates of <i>D. angustus</i> were collected and molecular characterization of the nematode and resistant rice varieties are in progress. • Ninety four isolates of <i>X. oryzae pv oryzae</i> have been collected, isolated, purified and preserved for characterization. • A mass screening method for screening of bakanae disease is progressing. 	Identification of races of pathogens and resistant sources to use as donor for developing disease resistant varieties.
26.	<p>Epidemiology of major rice diseases</p> <ul style="list-style-type: none"> • Seed infection of <i>Fusarium moniliforme</i> and its transmission to seedling has been studied. • Sheath rot infection causes quantitative and qualitative deterioration of seed. 	Importance of seed treatment for disease control.
27.	<p>Nutrient management to control rice diseases</p> <ul style="list-style-type: none"> • Considerable suppression of BB and ShB were recorded with K and Si. • Si application had no effect against Blast and Bakanae. • Zn and K were not effective against ufra disease. 	Disease control through nutrimental treatments.
28.	<p>Chemical control of rice disease</p> <ul style="list-style-type: none"> • Propizole found effective in controlling leaf scald disease. • Cemifuran 5G, Brifar 5G and Adfuran 5G were effective against ufra. • Nativo, Unisaff and Conza were effective against bakanae as seed treatment. 	Effective new chemicals for controlling rice disease.

29.	Crop loss assessment against rice hispa BR 4, BR 10, BRRI dhan31 and BRRI dhan32 showed yield loss of 15.55%, 14.43%, 13.13% and 12.38% respectively.	Make awareness on rice hispa attacks.
30.	Evaluation of chemicals and botanicals to insect pests <ul style="list-style-type: none"> • Mahagoni seed kernel extract caused 74.72 and 91.32% mortality of BPH and rice hispa respectively. • Eighty nine commercial formulations of insecticides were evaluated against BPH, RH and YSB of which 73 were found effective. 	<ul style="list-style-type: none"> • Eco-friendly control measures will be available against insect pests. • Recommended to PTAC for registration and commercial use.
31.	Vertebrate pest management Live capturing through bamboo traps, wire made snap traps and aluminum snap traps were found effective at Sylhet and Mymensingh regions.	Encouraging farmers to use traps for rodent management.
32.	Host plant resistance A total of 716 materials were screened against BPH, WBPH, GLH and SB. Twenty one materials showed MR against the insects.	Identification of resistant sources for breeding insect resistant varieties.
IV: Rice Farming Systems Program (RFSP) Area		
33.	Interventions for improving livelihoods <ul style="list-style-type: none"> • N-management through use of LCC. • Production of summer vegetables (Tomato, Cabbage and Okra). • Production of turmeric and ginger. • Management of mango, Jackfruit and litchi for high bearing and quality. • Rearing of goat chicken and pigeon advised. 	Livelihood improvement of small and marginal farmers.
34.	Practice of resource conservation technology Incorporation of maize residue to increase the productivity of DS Aman-Maize cropping system.	Use of natural resources for improving soil productivity.
V: Socio-Economics and Policy Program (SEPP) Area		
35.	Cost and return analysis of MV rice cultivation <ul style="list-style-type: none"> • Total cost of T. Aman= 33,665 Tk/ha. • Total cost of Boro= 56,120 Tk/ha. • Boro production is higher than T. Aman. • T. Aman cultivation brings higher profit than Boro rice. 	Estimate production and benefit sharing.

VI: Farm Machinery and Post harvest Program (FMPHP)	
	<p>Development of Agricultural Machine</p> <ul style="list-style-type: none"> • Designing weeder for dry land and wet land conditions.  <ul style="list-style-type: none"> • Single weeder for wet and dry land conditions.
36.	<p>Designing a manually operated USG applicator.</p>  <p>Help farmers for placement of USG economically.</p>
37.	<p>Milling and Processing Technology Optimization of whole plant drying in the field after harvesting for head rice recovery of long grain and aromatic rice.</p> <p>Field drying effect on the head rice recovery for long grains.</p>
38.	<p>Development of stores and storage technology Low cost seed storage structure was designed and fabricated.</p>  <p>Farmers can keep their seed in better condition with less cost.</p> <p style="text-align: center;">Super Bag</p>

39.	<p>Renewable Energy Technology</p> <p>A die-heater briquette machine was designed and fabricated. It was found that the combustion of briquette was not satisfactory.</p> 	Rice husk briquette production cost will be reduced.
40.	<p>Development of farm machinery</p> <ul style="list-style-type: none"> • Training on operation, repair and maintenance of BRRRI machinery were conducted in 14 places. • Demonstration of BRRRI rice-wheat reaper, BRRRI rice-wheat power thresher, BRRRI open drum thresher, BRRRI winnower and BRRRI weeder were exhibited to >400 farmers. • The Engineering drawing of rice-wheat reaper has been developed by two dimensional Auto-Cad tools. • Manuals on BRRRI weeder, reaper, thresher (ODT, TH7 and TH8), winnower and dryer were develop. 	Popularization of BRRRI machinery for quick, easy and economic rice production.
VII: Technology Transfer Program (TTP) Area		
42.	<p>Demonstration of irrigation through plastic pipe</p> <ul style="list-style-type: none"> • Reduce land and labour. • Quick reaching of water from tube well without water loss. • Increased irrigation efficiency Validated and demonstrated improved irrigation system using plastic pipe. 	Water resource saving.

<p>43. Validation of alternate wetting and drying (AWD).</p> <ul style="list-style-type: none"> • New irrigation technique for saving total irrigation water without hampering yield. • Water can be saved and irrigation cost can be reduced and farmers are motivated to apply this technique. • Water use as per crop demand and thus increase area for higher total productivity. 	<p>Judicious use of irrigation water for Boro season.</p> 
<p>44. Introduction of BRRI varieties in Jhum system</p> <ul style="list-style-type: none"> • Demonstration of BR24 and BR26 in Jhum system. • Eleven farmers were involved in 3 hill districts where 400 Jhumia farmers observed the trials. 	<p>Increased Total rice production in Jhum system.</p> 
<p>45. Upscaling of Directed-wet seeded rice (DWSR) using drum seeder</p> <ul style="list-style-type: none"> • In Aman season, 17 farmers successfully used drum seeder. • A total of 1100 farmers observed the drum seeded plots and 350 farmers were interested to use drum seeder in coming season. 	<p>Low cost rice cultivation system</p> 

46.	<p>Seed Production and Dissemination Program (SPDP)</p> <ul style="list-style-type: none"> • 92 demonstration were done in T. Aman and Boro season. • 2000 farmers observed the performance of the varieties. • About 18% of the farmers will take part in farmer to farmer seed exchange. 	<p>Motivating farmers for adopting new rice varieties.</p> 
47.	<p>Demonstration of LCC and USG</p> <ul style="list-style-type: none"> • 92 locations in T. Aman boro seasons. • Farmers can save urea (38-50kg/ha) by LCC. • 20% urea can be saved by USG. 	<p>Popularization of cost effective N management for rice cultivation.</p>
48.	<p>Farmer's Rice School 350 farmers were trained on medium rice cultivation techniques.</p> 	<p>Farmers motivated to adopt improved rice technologies.</p> 
49.	<p>Rice Production Training</p> <ul style="list-style-type: none"> • One month -37 Agricultural Officers (TOT) • One week-389 Sub Assistant Agricultural Officer (SAAO) of DAE and CARITAS. • One day training- 840 farmers at Rajshahi, Satkhira, Kushtia, Bhanga, Barishal and Sonagazi regions. • BRKB based tainting <ul style="list-style-type: none"> - A single module for rice production is completed. - A flip chart on rice production is prepared and used as farmers' training material. • Oriented training - 38 SA and SSA of BRRI as refresher course, 35 LSP of IC on hybrid seed production, 10 personnel of FoSHol in transferable technologies. 	<p>Up scaling rice production technologies to stakeholders for increasing rice production in the country.</p> 

50.	<p>Monga mitigation model</p> <ul style="list-style-type: none"> • BRRI dhan33 based crop diversification at grater Rangpur districts such that rice will be harvested within mid October. • Seeding of rabi crops will be advanced. • Agricultural labour will get works. • Marginal farmers will get food. • Trained 464 personnel of DAE including 7 NGOs of grater Rangpur. 	Master trainers will be built to advance the monga mitigation model.
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