Proposed Research Program 2022-2023

Sl. No.	Program Area/Project (Duration)	Major Objective	Expected output	Annual Budget (Thousand Tk.)
	Plant Breeding Division			
	Proposed Research Programme 2022-23			
	Program Area: Varietal Development program (VDP)			
1	Development of Upland Rice (Broadcast Aus)	Development of varieties in combination of multiple traits such as quick seedling emergence and vigorous growth, short growth duration (90-95 days), tolerance to lodging, drought and pre-harvest sprouting and good eating quality.	For B. Aus, promising lines/ varieties will be developed with short duration: 90-95 days, yield potential: 4.0-4.5 t/ha, with early vigor.	1000
	Development of Jhum/Hill Rice	Development of high yielding rice variety with low (10-19%) to intermediate (20-25%) and high (25%) grain amylose content and drought tolerance suitable for Jhum cultivation	For Jhum rice, high yielding rice variety with low (10-19%) to high (>25%) grain amylose content and drought tolerance along with good eating quality for jhum cultivation acceptable to tribal of Chattogram hill districts will be developed.	700
2	Development of Transplanted Aus (T. Aus) Rice	Introgression of earliness, pre-harvest sprouting tolerance and tolerance to high temperature into high yielding varieties for developing rice varieties with slender grain, short growth duration and resistance to major diseases under field condition.	Promising lines/ varieties will be developed with better yield potential (5.0–5.5 t/ha) and shorter growth duration (105-110 days) in comparison to existing varieties	2000
3	Improvement of rice for shallow flooded & Deep-water environment	Development of high yielding (4.0-5.0 t/ha) rice varieties for shallow flooded area (up to 1.0 m depth), shallow deep area (30 cm water) and medium deep area (50-60 cm water) along with submergence, facultative	High yielding (4.0-5.0 t/ha) rice varieties for shallow flooded area (up to 1.0 m depth), shallow deep area (30 cm water) and	1500

		elongation and hypoxia tolerance.	medium deep area (50-60 cm water) along with submergence, facultative elongation and hypoxia tolerance will be developed.	
4	Development of Rainfed Lowland Rice (RLR) (T. Aman)	Introgression of genes from diverged genetic background for the improvement of standard T. Aman varieties.	Short duration varieties (105-115 days) with 4.5-5.0 t/ha yield potential and medium duration (116-130 days) varieties with 6.0-7.0 t/ha yield potential will be developed.	5000
5	Development of Salt Tolerant Rice for T. Aman and Boro Season	Introgression of salinity tolerant traits/ gene (s) in high yielding varieties suitable for RLR and irrigated Boro ecosystem.	Promising Salt tolerant lines/salt tolerant varieties will be developed with seedling stage (EC 14 dS/m) & reproductive stage tolerance (EC 8-10 dS/m) and better yield potential (5.5-6.5 t/ha for the T.Aman and 7.5-8.0 for Boro season) in comparison to existing varieties	10000
6	Development of Premium Quality Rice (PQR) for T. Aman and Boro Season	Introgression of genes for small & long slender grain with aroma, photosensitivity and Anti-oxidant property into high yielding genetic background for the development of national and international grade aromatic rice.	National and international grade (Kalizira, Chinigura, Kataribhog, Basmati, Jasmine, Banglamoti and BRRI dhan34 type) high yielding aromatic varieties with earliness, good plant type, anti-oxidant potential will be developed.	7000
7	Development of favorable Boro Rice	Development of new genotypes based on the farmers and consumers preference with better plant type and major insect and disease	Rice varieties for favorable irrigated ecosystem will be developed with high	5000

		resistance.	yield potential (7.0-8.5 t/ha), earliness to long duration and acceptable grain quality.	
8	Development of Cold Tolerant Boro Rice	Introgression of cold tolerance gene into high yielding rice genetic background.	Cold tolerance rice varieties will be developed for cold affected northern, western and Haor region with high yield potential (6.5-7.5 t/ha).	8500
9	Development for Micronutrient Enriched Rice (ZER) for T. Aman & Boro	Development of new genotypes with high iron and zinc content along with resistance to major insect pests and diseases, and acceptable grain quality.	Rice varieties with high iron and zinc content with resistance to major insect pests and diseases and acceptable grain quality will be developed.	5000
10	Development of Insect Resistant Rice (IRR) for T. Aman & Boro Season	Introgression of genes of BPH and gall midge into high yielding rice genetic background.	BPH and Gall midge resistant variety will be developed with better yield potential (5.5-6.5 t/ha for T. Aman and 7.0-8.0 t/ha for irrigated Boro season).	3000
11	Development of Disease Resistant Rice (BB, Blast & RTV) for T. Aman and Boro season	Introgression of high yield, lodging tolerance and disease resistance trait for BB, Blast & RTV.	BB, Blast and RTV resistant varieties will be developed with better yield potential (5.5 – 6.0 t/ha for T. Aman season and 7.5-8.0 t/ha for Boro season).	2500
12	Development of Submergence and Water Stagnation Tolerance Rice	Development of high yielding (yield target 6.0-6.5 t/ha, in stress condition 5.0 t/ha) rice varieties tolerant to submergence (flash flooding) and medium stagnant water (MSW) stresses with high yield potential, short/long growth duration, weakly/strongly	High yielding rice varieties with different growth duration and three weeks submergence, stagnant flood and anaerobic germination tolerances with yield	2500

		photoperiod sensitivity, grain quality etc.	target 6.0-6.5 t/ha in normal condition and 5.5 t/ha in stress condition.	
13	Development of Water Saving Rice	Development of short duration water-use-efficient rice genotypes with 10% more yield than the check varieties under transplanted alternate wetting and drying (AWD) & aerobic condition.	Short duration water-use-efficient rice genotypes with 10% more yield than the standard check varieties will be developed for Boro season under transplanted alternate wetting and drying (AWD) & aerobic condition.	1500
14	Development of Drought Tolerant Rice for T. Aman Season	Introgression of drought tolerance genes into high yielding rice genetic background.	Drought Tolerant Varieties for T. Aman season will be developed with potential yield target (5.0 – 6.0 t/ha).	3000
15	Deployment and Validation of High Beta-carotene Rice and High-Iron & Zinc Rice Varieties (Healthier Rice Project), T. Aman and Boro 2020-21	Development of new genotypes with high Beta Carotene (Vitamin-A) content along with resistance to major insect pests and diseases, and acceptable grain quality.	Development of high yielding rice varieties with enhanced Provitamin A, high Iron and Zinc content in polished rice grain.	5000
16	International Network for Genetic Evaluation of Rice (INGER)	Promising genotypes will be selected after evaluation and will be used as parent materials and also will be included in yield trial.	Exchange of elite rice germplasm among the rice growing countries of the world and their evaluation, characterization and utilization under wider range of environments for ultimate use by farmers.	500
	Biotechnology Division			
	Proposed Research Program: 2022-23			

Sl. No.	Program Area/Project (Duration)	Major Objective	Expected output	Annual Budget (Thousand Tk.)
	Program Area/Project (Duration): Varietal Development program (VDP)			
1	Development of premium quality rice (Kalizira type) variety through anther culture	To develop high yielding premium quality rice DH lines through anther culture	High yielding premium quality rice lines (Kalijira Type) will be developed.	100.0
2	Development of Aus variety	To develop short duration high yield Aus rice variety through anther culture	Short duration high yield Aus rice lines will be developed	100.0
3	Development of high yielding photosensitive rice variety through anther culture	To develop photosensitive rice variety	Photosensitive rice lines will be developed	50.00
4	Development of low glycemic index (GI) rice variety	To generate low glycemic index rice through anther culture	Low glycemic index rice lines will be developed	100.0
5	Development of antioxidant enriched black rice variety through anther culture	To develop antioxidant enriched high yielding black rice	Antioxidant enriched high yielding black rice lines will be developed	100.0
6	Development of salt tolerant rice variety through anther culture	To develop salt tolerant double haploid rice lines	Salt tolerant double haploid rice lines will be developed.	100.0
7	Studies Study on Kernel Elongation of Rice	to develop long slender rice variety with high kernel elongation (>1.7	Long slender rice lines with high kernel elongation will be developed	500.0
8	Development of somaclonal variants using EMS treated rice seed	To develop modern rice varieties for Aus and T. Aman	Modern Aus and T. Aman rice lines will be developed	200.0
9	Development of antioxidant enriched black rice variety through somaclonal variation	To create somaclonal variation for development of antioxidant enriched high yielding modern rice variety	Antioxidant enriched high yielding modern rice lines will be developed	150.00
10	Preliminary Yield	To evaluate further yield potential	Aus rice lines will be	50.00

	Trials (PYT) in T. Aus 2022	of advance breeding lines.	developed	
11	Development of premium quality rice (Kalizira type) variety through somaclonal variation	To create somaclonal variation towards development of high yielding premium quality (Kalijira type) rice varieties	Premium quality (Kalijira type) rice lines will be developed	50.00
12	Effect of hormone on plant regeneration of rice genotypes	optimization of regeneration protocol for transformation studies	Regeneration protocol will be developed	100.0
13	Effect of incubation days on callus induction and plant regeneration of rice genotypes	to observe the effect of day on calli production and regeneration	Regeneration protocol will be developed	100.0
14	Devlopment of High yielding variety through somaclonal variation	To create somaclonal variation towards development of high yielding rice variety	High yielding variety rice lines will be developed	100.0
15	Development of high yielding premium quality rice variety through somaclonal variation	To create somaclonal variation and select rice lines with high yield and desirable premium quality traits	Premium quality somaclone rice lines with high yield and desirable traits will be developed.	100.0
16	Development of variants using EMS of BRH-11-9-11-4-5B(CN6) having reduced sterility	To reduced sterility of BRH-11-9-11-4-5B (CN6)	High yielding with reduced sterility BRH-11-9-11-4-5B (CN6) rice lines will be developed	100.0
17	Development of high yielding short stature aromatic Kilizira type varieties using EMS	To develop high yielding short stature aromatic Kilizira type varieties	High yielding short stature aromatic Kilizira type rice lines will be developed	100.0
18	Development of Sheath Blight resistant rice through mutation by EMS	To develop Sheath Blight resistant lines	Sheath Blight resistant rice lines will be developed	150.00
19	Development of	High yielding lines through	High yielding rice	100.0

	High yielding rice by EMS treatment	mutation by EMS.	lines will be developed	
20	Development of Premium Quality Rice through Mutation by EMS (Ethyle Methanesulfonate)	To create somaclonal variation for developing high yielding, short growth duration and short stature plant type aromatic rice lines.	Premium Quality rice lines with high yield, short growth duration will be developed.	100.0
21	Developing rice variety through wide hybridization followed by embryo rescue	To develop high yielding rice lines through wide hybridization followed by embryo rescue technique.	High yielding and short duration rice lines will be developed.	100.0
22	Marker assisted selection for fragrance gene	To develop high yielding aromatic rice	High yielding aromatic rice lines will be developed	100.0
23	Development of photosensitive high yielding rice variety	To identify genomic location controlling photosensitivity.	Photosensitive high yielding rice lines will be developed	50.00
24	Marker assisted selection for aromatic and submergence tolerance rice genotype	To develop high yielding submergence tolerant aromatic rice variety	High yielding submergence tolerant aromatic rice lines will be developed	50.00
25	Marker assisted selection for developing short stature Biroi rice	To develop high yielding biroi type rice varieties	Short stature Biroi rice lines will be developed	50.00
26	Isolation and cloning of drought tolerant genes from wheat	Isolate and cloning of drought tolerance gene	Drought tolerance gene will be isolated for the development of drought tolerant rice lines	200.0
27	Development of salt tolerant transgenic rice	To develop salt tolerant transgenic rice lines	Salt tolerant transgenic rice lines will be developed	500.0
28	Introgression of salt tolerant mangrove gene.	To develop salt tolerance transgenic rice lines	Salt tolerant transgenic rice lines will be developed	500.0
29	Development of salt tolerant transgenic rice	To develop salt tolerant transgenic rice lines	Salt tolerant transgenic rice lines will be developed	500.0
30	Development of high yielding	To develop high yielding aromatic rice lines using CRISPR-Cas9	High yielding aromatic rice lines	500.0

	aromatic rice lines through genome editing	technology.	will be developed	
31	Identification of *Setaria italica* mutants losing C4 properties.	Characterizing *Setaria italica* mutant population for loss of C4 functions	C4 rice lines will be developed	500.0
32	Variation of *BADH2* gene sequences in rice genotypes	To investigate the nature of the fragrance gene (*frg*) in local aromatic cultivars	Variation of fragrance gene (*frg*) in local aromatic cultivars will be identified	500.0
	Hybrid Rice Division			
	Proposed Research Program: 2022-23			
Sl. No.	**Program Area/Project (Duration)**	**Major Objective**	**Expected output**	**Annual Budget (Thousand Tk.)**
	Program Area: Varietal Development			
	Project: Development of parental materials for high yield, high amylose content and fine grain containing hybrid rice variety **Duration: 2022-2023** **Program leader- Dr. Md. Jamil Hasan**			
1.1	Source Nursery	Identification of prospective maintainers and restorers from diverse genetic origin	As much as cross will be initiated	75,000.00
1.2	Test cross Nursery	1. Confirmation of maintainers and restorers from the crossed entries, 2. Selection of heterotic rice hybrids, 3. Conversion of prospective materials into new CMS lines.	New B & R lines will be identified	100,000.00
1.3	Backcross Nursery	Developing CMS lines from identified suspected maintainer lines by back crossing.	New CMS lines will be developed	80,000.00
1.4	CMS Maintenance and Evaluation Nursery	Maintain and evaluate of CMS lines for genetic purity and subsequent use	Genetic purity of CMS lines will be maintained	100,000.00
1.5	Improvement of parental lines by (B x B) crosses.	To broaden the genetic base of maintainer lines and selection of the recombinant lines	New recombinant B lines will be developed	70,000.00
1.6	Improvement of parental lines by (R	To broaden the genetic base of restorer lines and selection of the	New recombinant R lines will be	70,000.00

	x R) crosses.	recombinant lines	developed	
1.7	Evaluation of Fatema dhan and its generation advancement	To select fix lines from Fatema dhan	Fixed lines of Fatema dhan will be developed	70,000.00
1.8	Evaluation of MST (Multi-Stress Tolerant) lines	To identify prospective maintainer and restorer lines having MST traits	B & R lines will be identified in the background of MST	70,000.00
1.9	Development of Blast resistant hybrid	1. Searching genotypes containing both blast disease resistant genes and Restorer genes 2. Making cross to transfer blast resistant genes into elite Restorer background	Blast tolerant hybrid variety will be developed	100,000.00
1.10	Parental line characterization using diagnostic trait markers (SNP markers) through outsourcing	To find out suitable hybrids having genes of interest like good biochemical properties and stress resistance	Gene of interest of parental materials will be identified and resistant and heterotic group will be formed accordingly	500,000.00
1.11	New parental line development using FRGA method using RxR and BxB crosses (F_2 to F_5 crosses)	Developing new parents to produce new cross combination derived hybrids	New recombinant B & R lines will be developed in short possible time	300,000.00
1.12	Development of Salinity resistant hybrid	1. Searching genotypes containing both salinity resistant genes and Restorer genes 2. Making cross to transfer salinity resistant genes into elite Restorer background	Salinity tolerant hybrid variety will be developed	100,000.00
	Project-2: Breeding for BB resistant hybrid rice variety **Duration: 2022-23** **Program leader- Dr. Anowara Akter**			
2.1	Development of disease resistant parental lines (BB)	To develop new CMS and restorer lines resistance to disease (BB) and find out heterotic rice hybrid combinations having resistance to disease (BB)	BB resistant parental lines as well as hybrids will be developed	200,000.00
2.2	Screening of existing maintainers and restorers against BB resistance.	To identification of BB resistance maintainers and/or restorers from existing materials.	New source of BB resistant maintainer lines will be identified	80,000.00

2.3	Screening of existing maintainers and restorers against Blast resistance.	To identification of blast resistance maintainers and/or restorers from existing materials.	Blast resistant B & R lines will be identified	70,000.00
2.4	Source Nursery	Identification of prospective maintainers and restorers of diversified origin for making experimental rice hybrids.	As much as cross will be initiated	60,000.00
2.5	Test cross Nursery	1. Confirmation of maintainers and restorers from the crossed entries. 2. Selection of heterotic rice hybrids. 3. Conversion of prospective maintainers into new CMS lines	New B & R lines will be identified	50,000.00
2.6	Backcross Nursery	Developing BB resistant CMS lines from identified maintainer by back crossing.	New CMS lines will be developed in the background of BB	200,000.00
	Project-3: Evaluation of parental materials & hybrids **Duration: 2022-2023** **Program leader- Program leader- Dr. Mosammat Umma Kulsum**			
3.1	Observational Trial (OT) of experimental hybrids	Selection of promising hybrids	Selection of promising hybrids	85,000.00
3.2	Preliminary Yield trials of promising hybrids	To study the wider adaptability and yield potentiality of promising hybrids	Selection of promising hybrids	200,000.00
3.3	Multi-location trials of promising hybrids	To find out promising hybrids with high yield potential and higher adaptability	Selection of promising hybrids with wider adaptability	500,000.00
3.4	Combining ability of A, B & R lines	To select the best combiner (S) in respect of grain yield & yield components	SCA & GCA will be identified	85,000.00
3.5	National Hybrid Rice Yield Trial (NHRYT)	Evaluation of imported hybrids for subsequent selection	Potential hybrids will be selected	Funded by SCA
3.6	Quality ensure of previous season produced F_1 and CMS lines through grow out test	To determine purity of parental lines and hybrids of BRRI released hybrid rice	Ensure quality of CMS & F1 seeds	50,000.00
3.7	Evaluation of exotic hybrids and parental and	To evaluate adaptability and yield performance of exotic materials	Better adaptability of exotic lines will be identified	200,000.00

	source materials (A, B, R & F_1)			
3.8	Demonstration trials of BRRI released hybrids along with promising hybrids and checks	To evaluate the performances of released hybrids with promising ones	Selection of best hybrids compared with check varieties	50,000.00
3.9	Identification of promising combiners developed using iso-cytoplasmic restorers (ICR)	To determine the selected ICR lines for assessing their potential in hybrid development	Promising combinations will be identified based on GCA & SCA	100,000.00
3.10	Breeding for outcrossing potentials in CMS lines	To select best CMS lines for enhancing seed production of hybrid rice	Potential CMS lines with good OCR will be identified	200,000.00
	Project-4: Seed Production of Parental lines and Hybrids **Duration: 2022-2023** **Program Leader: Dr. Md. Jamil Hasan and Dr. Hafizar Rahman**			
4.1	Seed multiplication of promising CMS lines	To produce pure and good quality seed of CMS lines for subsequent use.	Sufficient quantity of CMS seeds will be available	200,000.00
4.2	CMS multiplication of BRRI hybrid dhan1 & BRRI hybrid dhan4	Production of pure and good quality seed of CMS lines.	Sufficient quantity of CMS seeds of BHD1 & BHD4 will be available	200,000.00
4.3	CMS line multiplication of BRRI hybrid dhan2	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD2 will be available	150,000.00
4.4	CMS line multiplication of BRRI hybrid dhan3	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD3 will be available	300,000.00
4.5	CMS line multiplication of BRRI hybrid dhan5	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD5 will be available	300,000.00
4.6	CMS line multiplication of BRRI hybrid dhan6	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD6 will be available	300,000.00
4.7	CMS line multiplication of BRRI hybrid dhan7	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD7 will be available	150,000.00
4.8	CMS line multiplication of BRRI hybrid dhan8	Production of sufficient quantity quality seeds of CMS lines for subsequent use	Sufficient quantity of CMS seeds of BHD8 will be available	150,000.00

4.9	F_1 seed production of BRRI hybrid dhan2 & BRRI hybrid dhan4	Production of sufficient quantity quality hybrid seed for subsequent use	Sufficient quantity F1 of BHD2 & BHD4 will be available	200,000.00
4.10	F_1 seed production of BRRI hybrid dhan3	Production of sufficient quantity quality hybrid seed for subsequent use	Sufficient quantity F1 of BHD3 will be available	600,000.00
4.11	F_1 seed production of BRRI hybrid dhan5 & BRRI hybrid dhan7	Production of sufficient quantity quality hybrid seed for subsequent use	Sufficient quantity F1 of BHD5 & BHD7 will be available	850,000.00
4.12	F_1 seed production of BRRI hybrid dhan6	Production of sufficient quantity quality hybrid seed of promising hybrids for subsequent use	Sufficient quantity F1 of BHD6 will be available	300,000.00
4.13	F_1 seed production of BRRI hybrid dhan8	Production of sufficient quantity quality hybrid seed of promising hybrids for subsequent use	Sufficient quantity F1 of BHD8 will be available	400,000.00
4.14	F_1 seed production of promising hybrids	To produce sufficient quantity of seed for PYT and MLT	Sufficient quantity F1 of promising hybrids will be available	350,000.00
4.15	Growth duration differentiation method (GDDM) for synchronization in flowering	To determine proper heading time of parental lines (A & R) of promising hybrids	Determination of actual growth duration difference between A & R lines will be identified	50,000.00
4.16	Nucleus seed production of BRRI hybrid dhan1 & BRRI hybrid dhan4	To produce parental lines nucleus seed of BHD1 & BHD4	Nucleus seeds of parental lines of BHD1 & BHD4 will be produced	70,000.00
4.17	Nucleus seed production of BRRI hybrid dhan2	To produce parental lines nucleus seed of BHD2	Nucleus seeds of parental lines of BHD2 will be produced	70,000.00
4.16	Nucleus seed production of BRRI hybrid dhan3	To produce parental lines nucleus seed of BHD3	Nucleus seeds of parental lines of BHD3 will be produced	70,000.00
4.17	Nucleus seed production of BRRI hybrid dhan5	To produce parental lines nucleus seed of BHD5	Nucleus seeds of parental lines of BHD5 will be produced	70,000.00
4.18	Nucleus seed production of	To produce parental lines nucleus seed of BHD6	Nucleus seeds of parental lines of	70,000.00

	BRRI hybrid dhan6		BHD6 will be produced	
4.19	Nucleus seed production of BRRI hybrid dhan7	To produce parental lines nucleus seed of BHD7	Nucleus seeds of parental lines of BHD7 will be produced	70,000.00
4.20	Nucleus seed production of BRRI hybrid dhan8	To produce parental lines nucleus seed of BHD8	Nucleus seeds of parental lines of BHD8 will be produced	70,000.00
4.21	Maintainer and restorer lines multiplication of promising and released hybrids	Production of sufficient quantity quality parental lines for subsequent use	Seed multiplication of released & promising B & R lines will be made	100,000.00
	Genetic Resources and Seed Division (GRSD)			
	Proposed Research Program: 2022-23			
Sl. No.	**Experiments /Activities**	**MajorObjective(s)**	**Expected output**	**Budget (Lakh Tk.) source**
	Project 01: Rice Germplasm Conservation and Management.	**Collection, characterization, conservation and rejuvenation of rice germplasm to enrich the Genebank of BRRI and its sharing with rice researchers.**		**11.05 GOB**
1.1	Collection of rice (Oryza sativa L.) germplasm.	To collect cultivated and wild rice germplasm from unexplored areas of Bangladesh and to store the collected rice germplasm for different users.	• Collected germplasm will be conserved safely and documented along with their characters in Genebank and in computer database. • Conserved germplasm with valuable traits will be made available for utilization as parent material(s) for developing new variety(s)/genotype.	3.20
1.2	Collection of rice	To collect cultivated and wild rice		0.90

	(*Oryza sativa* L.) germplasm.	germplasm from unexplored areas of Bangladesh and to store the collected rice germplasm for different users.		
1.3	Rejuvenation and conservation of rice germplasm.	To rejuvenate the Genebank accessions with fresh stock and to register the new collection by giving BRRI Genebank accession number after cross checking the duplication.		0.15
1.3	Rice germplasm supply and exchange.	i. To provide/supply rice germplasm accessions from BRRI Genebank to different divisions of BRRI for screening against biotic and abiotic stresses. ii. To share germplasm to researchers from home and abroad with prescribed MTA for rice improvement.		0.80
1.4	Morphological characterization of rice germplasm.	To characterize rice germplasm as per BRRI prescribed "Germplasm Descriptors and Evaluation Form" as developed from biodiversity international and UPOV convention.		1.00
1.5	Documentation of rice germplasm.	To document the characterized rice germplasm through morpho-physiological data, digital photo, leaflet and to develop a computer database documentation system for different users.		
1.6	Molecular characterization of rice germplasm.	To characterize the rice germplasm through molecular tools (DNA Fingerprinting).		5.00
2	**Project 02: Exploratory and Genetic Studies.**	**Exploratory and genetic studies of rice germplasm.**		**8.15 GOB**
2.1	Regional Yield Trial (RYT) of Balam rice germplasm.	To confirm the yield potentiality of popular Balam rice germplasm of southern region of Bangladesh by comparing with standard check.	The genetic parameters/genetic studies of respective year will be helpful for varietal development and other plant breeding	1.00

			related issues	
2.2	Regional Yield Trial (RYT) of Sada Mota rice germplasm of southern region.	To confirm the yield potentiality of popular Sada Mota rice germplasm of southern region of Bangladesh by comparing with standard check.		1.00
2.3	Selection of superior genotypes from T. Aman/ Boro rice germplasm based on agro-morphological traits.	To identify rice germplasm with higher total biomass yield and higher phenotypic acceptance.		0.50
2.4	Observational Yield Trial (OYT) of aromatic rice germplasm.	To evaluate the yield performance of ten aromatic rice germplasms compared to standard check.		0.40
2.5	DNA Finger printing of rice germplasm.	To characterize the rice germplasm through molecular tools (DNA Fingerprinting).		1.00
2.6	Evaluation of Photo-sensitive rice germplasm collected from Northern districts of Bangladesh.	To identify rice germplasm suitable for late transplanting after flood in northern region of Bangladesh (Bogura, Kurigram, Lalmonirhat, Gaibandha, Rangpur and Jamalpur).		0.25
2.7	Characterization of similar named groups of rice germplasm.	To characterize and evaluate the similar named groups of Nazirsail and Basmoti rice germplasm accessions for developing their core collections.		0.50
2.8	Crossing between Chinisail and BRRI dhan90.	To improve the grain quality with better yield		0.50
2.9	Purification of selected Jirasail genotype.	To purify the selected popular Jirasail genotypes for evaluation of its yield performance by comparing with standard check.		0.30
2.10	Molecular characterization of pigmented rice germplasm.	To characterize pigmented rice germplasm using SSR markers.		0.60
2.11	Identification and selection of Sticky rice from Jhum rice	To identify and to study the selection criteria for developing sticky rice varieties from Jhum rice		0.60

	germplasm.	germplasm.		
2.12	Conformation of selected blast resistant materials using differential blast isolates and molecular markers.	To be conform the resistance of the selected genotypes.		0.50
2.13	Morphological and Molecular study of Badshabhog germplasm.	To characterize the rice germplasm through morphological and molecular tools (DNA Fingerprinting).		1.00
3	**Project 03: Seed Production and Variety Maintenance**	**Maintenance of nucleus seed stock and production for supplying breeder seeds as per national demand**		**89.80 GOB**
3.1	Nucleus seed production.	To maintain genetic purity and homogeneity of morphological characteristics of BRRI developed rice varieties as a source of breeder seed.	• Varietal purity (both genetic and physical) will be maintained. • Breeder seed will be supplied to GO, NGOs and private sector seed producing organizations. • Limited quantity of quality seed (QS) will be supplied to other divisions/Regional stations of BRRI and farmers directly or through DAE personnel for experimental/exhibition purpose	0.90
3.2	Maintenance of BRRI recommended HYVs and LIVs.	To maintain the BRRI recommended HYVs (High Yielding Variety) and LIVs (Locally Improved Variety) for encouraging farmers to cultivate and for any other purpose.		0.20

3.3	Breeder seed production and distribution.	To produce and supply of breeder seed of BRRI developed rice varieties as per indent of GO, NGOs and PS seed producing organizations/companies/entrepreneurs.		85.0
3.4	Sending *khudebarta* (SMS) for Breeder Seed Distribution.	To make it easy for our clients to get the information of BS distribution.		0.50
3.5	Monitoring of breeder seed production farms.	To visit breeder seed plots of BRRI regional stations at flowering and maturity stages for ensuring the quality of produced seed as BS standard.		0.80
3.6	Monitoring of foundation seed production farms.	To visit foundation seed (FS) plots of seed producing agencies at flowering and maturity stages for improving the quality of produced seed as FS standard by sharing experiences.		0.60
3.7	DNA Fingerprinting of latest BRRI varieties (continue).	To characterize the latest BRRI varieties through molecular tools (DNA Fingerprinting).		1.00
3.8	Effect of regional variation of weather parameters, cultural management, post-harvest processing and seed storage on seed quality of BRRI dhan89.	i. To determine viable period of seed in different storage. ii. To determine speed of germination and germination percentage.		0.50
3.9	Dormancy and storage ability of newly released BRRI rice varieties.	To find out dormancy duration and storage ability of newly released BRRI rice varieties (after BRRI dhan64) during storage.		0.30
4	**Project 04: Seed Technology Packages.**	**Studies on seed technology for recommending as modern rice seed production technology.**	The quality seed production related important/current problems at farmers' field will be solved with appropriate recommendations through the developed seed	**1.5 GOB**

			technology package	
4.1	Publication on seed production technology package.	To make seed technology knowledge available to the growers by preparing leaflet on seed production techniques for BRRI Rice Seed Network partners.		1.20
4.2	Digital rice herbarium.	To easily identify difference between different BRRI variety in a look.		0.30
	Grain Quality and Nutrition Division			
	Proposed Research Programme -2022-2023			
Sl. No.	**Program Area/Project (Duration)**	**Major Objective**	**Expected output**	**Annual Budget (Thousand Tk.)**
	Program Area: varietal Development			
	1. Grain Quality Characteristics for Varietal Development			
1.1	Determination of physicochemical and cooking properties of advanced rice breeding lines.	To help to develop data base on physicochemical, cooking and eating qualities of grain for newly developed breeding lines	Grain quality data from breeding lines will be generated for development of new rice variety.	2.5 GOB
1.2	Determination of physicochemical and cooking properties of transforming rice breeding lines	To find out the physicochemical and eating quality of promising lines for identifying better grain quality.		TRB Funded
1.3	**1.3**: Effect of Zn and phytate activities on Zn enriched rice varieties at different locations in T. Aman season	To determine the Zn and phytate activities with physicochemical properties of Zn enriched rice varieties at different locations in T. Aman season		0.5 GOB
1.4	Nutraceutical Characterization of newly released BRRI varieties	To determine nutraceutical properties including antioxidants, minerals, fatty acid and amino acid profiling's of BRRI released HYVs from BR1 to BRRI dhan100 and BRRI hybrid1 to BRRI hybrid dhan7 along with their		2.0 GOB

		physicochemical and cooking properties		
	2. Grain Quality parameters for Consumer Preference			
2.1	**2.1:** Analysis of ferulic acid (FA) in RBO of Bangladeshi rice varieties in association of biochemical evaluation on burning effects of RBO in vivo rat experiment	**1.** To evaluate on appropriate analysis methodology and study amount of FA and their relation to nutrition properties in rice. **2.** To evaluate the burning effects of RBO		0.5 GOB
2.2	**2.2:** A study on the different components of rice in relation to the palatability	**1.** To identify the parameters of rice grain through comparison of different components of rice samples that are responsible for palatability		1.0 GOB
	2.3: To Screening, Selection, and Training of Sensory Panelists	**1.** To determine impairment of primary senses (colour, vision, ageusia and anosmia) **2.** To matching test for taste and odor substances **3.** To ability to detect basic taste and odor acuity **4.** To determine ability to characterized texture **5.** To performance in comparison with other candidates		1.0 GOB
	3.Nutritional Quality Assessment of Rice			
	3.1: Fatty acid profiles and nutritional quality of rice bran oil (RBO) in BRRI high yielding varieties	**1.** To identify the varieties containing higher amount of oil content **2.** To analyze the fatty acid profile, heavy metal and nutritional value of rice bran oil		1.5 GOB
	3.2: The effect of fermentation on the nutritional and microbial changes in panta bhat	**1.** To evaluate the nutritional properties of panta bhat **2.** To determine the starch digestibility and bioavailability of mineral content **3.** To evaluate the microbial properties and beneficial effect of		1.0 GOB

		panta bhat		
	3.3: Comparative study on rice bran oil (RBO) produced from BRRI varieties with existing RBO available in the market (Recommendation from BARC workshop-2021)	**1.** To observe the chemical properties of RBO **2.** To analyze the FA profile, heavy metal and nutritional value of RBO		1.0 GOB
	3.4: Assessment of heavy metals (Cd, Zn, Pb, Cr, As) in soil, water, and rice grain from industrial area (Dhaka, Gazipur, Narayangonj, Mymensingh, Narshindi etc.)	**1.** To quantify heavy metals in soil, water, and rice grain. **2.** To identify area of rice field contaminated by industrial effluent water.		1.0 GOB
	3.5: Standardization of in vitro Glycemic Index (GI) method to evaluate GI value of rice	**1.** To standardize the in vitro GI method **2.** To assess the variability of GI value through in vitro starch digestibility of physicochemically different BRRI varieties		3.0 GOB
	4.Commercial Rice Based Products			
	4.2: Survey on rice based value added products available in the market (Recommendation from BARC workshop-2021)	**1.** To find out BRRI varieties are used commercially for producing rice based products **2.** To analyze the nutritional quality of value added rice based products in the market		3.0 GOB
	4.3: Formulation of rice-based foods supplemented with anthocyanin-enriched fermented rice bran (New)	**1.** Physicochemical and biochemical characterization of pigmented anthocyanin rich rice varieties. **2.** Genome sequencing and analysis of gene expression in the anthocyanin biosynthesis pathway in selected Bangladeshi rice		GQN-KGF-OFANS Project Funded 2022-24 (3 years)

		varieties. **3.** Formulation of anthocyanin-fortified rice-based bakery products with fermented rice bran		
	Rice Farming Systems Division			
	Proposed Research Program: 2022-2023			
Sl. No.	**Program Area/Project (Duration)**	**Major Objective**	**Expected output**	**Annual Budget (Thousand Tk.)**
	Program Area: Rice Farming Systems			
1	**Survey**			
1.1	Characterization of farming system of Charlands	To characterize and generate information on the farming system and identify problem and prospects of Charlands in Noakhali, Barishal, Rangpur, Sirajganj, Faridpur and Bhola regions for exploring its opportunities of improvement	Pros and cons will be drive-out and based on the survey result new experiment will be formulated in char area.	500
2	**Development of Cropping System and Component Technology for Favorable Environment**			
2.1	Performance evaluation of four-crop cropping pattern for irrigated medium high land ecosystem (2022-2027)	i) To evaluate the agronomic and economic performance of three crops cropping pattern ii) To assess the soil fertility, water requirement and pest infestation in different cropping patterns	Profitable, water efficient and sustainable four-cropped cropping pattern(s) will be found.	200
2.2	Performance evaluation of three-crop cropping pattern for irrigated medium high land ecosystem (2022-2027)	i) To evaluate the agronomic and economic performance of three crops cropping pattern ii) To assess the soil fertility, water requirement and pest infestation in different cropping patterns	Profitable, water efficient and sustainable three-cropped cropping pattern(s) will be found.	300
2.3	Long-term evaluation of major rice based cropping pattern 2020-2022	i) To determine the long-term implication of two, three and four cropped cropping pattern on system productivity, economics, weed and pest infestation, water and other input use, soil health, nutritional and energy output	Profitable, water efficient and sustainable two, three and four-cropped cropping pattern(s) will be found.	500
2.4	Determination of optimum planting window of newly	i) To find out the suitable rice varieties for Boro-Fallow-T. Aman cropping pattern under different	Suitable variety and optimum sowing/planting	200

	released rice varieties in Mustard-Boro-T. Aman cropping system. 2022-2024	planting time ii) To find out the optimum sowing/planting window of mustard, Boro and T. Aman rice for Boro-Fallow-T. Aman cropping pattern	window of mustard, Boro and T. Aman rice for Mustard-Boro-T. Aman cropping pattern will be developed.	
2.5	Exploration of water logged wetland ecosystem through integrated fish, vegetable and fruit production. 2022-2026	i) To explore the best adaptation practices to address the water logged wetland condition ii) To enrich the nutrient consumption, production diversity and risk mitigation	Scope of increasing productivity of water logged wetland ecosystem will be identified.	500
2.6	Land-Water interfacing with rice-fish, vegetables, fruit to Intensify the system productivity. 2022-2024	i) To diversify and maximize production of pond-based farming system. ii) To improve nutritional level of consumers and increase farm income	Development of shallow mini pond system to maximize the food production	400
2.7	Transformation of waterlogged wetland into three-tier system for integrated rice-fish, vegetables and fruit production. 2022-2025	i) To increase productivity and production diversity through integrating rice-fish, vegetables and fruits ii) To meet up the nutritional requirements of the farm family throughout the year and increase income	The productivity of water logged wetland ecosystem will be increased.	300
2.8	Evaluation of newly released BRRI rice varieties under Boro - Fallow-T. Aman cropping pattern. 2022-2025	i) To find out the suitable crop sequence with newly released BRRI rice varieties in Boro -Fallow-T. Aman cropping pattern	Suitable crop sequence with newly released BRRI rice varieties in Boro-Fallow- T. Aman cropping pattern will be developed.	200
2.9	Optimizing transplanting window of premium quality T. Aman rice varieties under different and changing climatic conditions in Bangladesh using ORYZA V3.	i) To determine the effects of sowing dates, seedling age and transplanting dates for popular premium quality T. Aman rice varieties having different growth duration ii) To utilize the rice crop data in simulation modeling by ORYZA v3 to determine optimum transplanting window, sowing time and seedling	Transplanting window will be developed after ORYZA model simulation.	200

	2020-2022	age, target yields and develop associated management recommendations for increased rice yields and higher water productivity.		
2.10	Optimizing transplanting window of premium quality Boro rice varieties under different and changing climatic conditions in Bangladesh using ORYZA v3. 2020-2022	i) To determine the effects of sowing dates, seedling age and transplanting dates for popular premium quality Boro rice varieties having different growth duration ii) To utilize the rice crop data in simulation modeling by ORYZA v3 to determine optimum transplanting window, sowing time and seedling age, target yields and develop associated management recommendations for increased rice yields and higher water productivity	Transplanting window will be developed after ORYZA model simulation.	200
2.11	Determine the effect of nutrient management practices on premium quality rice variety/(s) for improved yield, grain quality, and milling traits. 2020-2022	To develop site-specific tailored management practice to improve the yield potential and quality aspects of PQR rice varieties	For the improvement of grain quality, suitable nutrient management strategies will be developed.	350
2.12	On-farm performance evaluation dry direct seeded rice (DSR) as compared with transplanted rice (TPR) in Aus season. 2020-2022	Determine comparative advantages and disadvantages of different methods of crop establishment in DSR with respect to TPR for some newly released Aus varieties	Appropriate establishment method for different land type were developed for selected varieties	250
2.13	Effect of sowing date and establishment methods on yield and productivity of newly released Aus rice varieties. 2020-2022	i) Determine comparative advantages and disadvantages of DSR with respect to TPR ii) Identify suitable sowing dates for newly released Aus rice varieties	Appropriate sowing date and establishment method for different land type were developed for selected varieties	150
3	**Development of Cropping System and Component Technology for Stress Prone Area**			

3.1	Intensification of Watermelon-Fallow-T. Aman cropping pattern by inclusion of Aus rice. 2021-2023	i) To find out the suitable BRRI released rice varieties for Watermelon-T. Aus-T. Aman CP ii) To maximize the production and farm	Suitable rice varieties will be found to fit under Watermelon-T. Aus-T. Aman cropping pattern	200
4	**Development of Cropping System Technologies for Hill Ecosystem**			
4.1	Exploring the hills for rice research: Feasibility study for exploring spring water for Boro cultivation. 2022-2023	i) To explore available water resource (Chhara) in hilly areas ii) To expand Boro rice cultivation using low lift pump (LLP) for irrigation in Fallow-Fallow-T. Aman cropping pattern iii) To increase the overall rice production in hilly areas	Potential area of Boro cultivation will be identified.	350
4.2	Exploring the hills for rice research: Feasibility of Boro rice cultivation in fringe land at Rangamati district. 2022-2023	To increase the Boro coverage across the fringe land by cultivation of different Boro rice varieties	Potential area of Boro cultivation will be identified.	200
4.3	Improvement of Jhum production system through the introduction of modern HYV Aus varieties in hilly areas. 2021-2023	To increase the system productivity through the introduction of modern HYV Aus varieties and to compare their performance with the local varieties in jhum culture	Appropriate HYV varieties will be identified for the cropping pattern specified.	250
4.4	Inclusion of mustard in Boro-Fallow-T. Aman cropping pattern in piedmont plain land. 2021-2023	To increase the system productivity of Boro-Fallow-T. Aman cropping system by the inclusion of mustard	Farmers will understand the importance of growing mustard throughout the transition phase in order to boost system productivity.	450
4.5	Intensification of Fallow-Fallow-T. Aman cropping pattern through the inclusion of modern Aus rice in piedmont plain	To increase the system productivity of Fallow-Fallow-T. Aman cropping system by inclusion of Aus rice	In single T. Aman area farmers would have a general concept of how to cultivate aus before T Aman rice.	350

	land in hilly areas. 2021-2023			
4.6	Fertilizer management in HYV Aus rice in Jhum cultivation system. 2021-2023	i) To develop a suitable method of fertilizer application in HYV Aus under jhum cultivation ii) To increase fertilizer use efficiency through proper management	For Jhum systems, the best nutrient management approach will be designed.	250
5	**Validation and Delivery of Cropping System Technology**			
5.1	Evaluation of newly released BRRI rice varieties under Potato-Boro-T. Aman cropping pattern. 2021-2023	i) To find out the suitability of newly released BRRI rice varieties under Potato-Boro-T. Aman cropping pattern ii) To maximize the production and farm income	Appropriate rice varieties will be identified for Potato-Boro-T. Aman cropping pattern that will maximizes the production and income.	250
5.2	Validation and delivery of site specific rice based improved cropping patterns in different agro ecosystem across the country. 2021-2027	i) To increase the system productivity and income of the farmers through introduction of improved and intensified cropping systems	System productivity will be increased.	3200
5.3	Potato-Jute-T. Aman cropping pattern in enclaves of northern Bangladesh (ID-672) 2021-2022	To increase the farm productivity in farmer's level	Cropping intensity will be higher and total production of farmers will increase.	500
5.4	T. Aman rice-Mustard-Patshak-Aus rice cropping pattern for Mymensingh (ID089); 2021-2022	To increase the farm productivity in farmer's level	Cropping intensity will be higher and total production of farmers will increase.	500
5.5	Novel plant growth promoting (PGP) bacterial and fungal bio pesticides for sustainable management of	To increase the farm productivity in farmer's level	Sustainable method to control bacterial blight of rice will be developed.	300

	bacterial blight of rice (ID-091) ; 2021-2022			
5.6	Formulation of energy dense rice biscuit (EDRB) (ID-099); 2021-2022	To alleviate malnutrition among different groups of people	High quality rice biscuit will be developed.	350
6	**Integrated Farming Systems**			
6.1	Development of Integrated Farming Systems for Different Farm Categories for Improving the Livelihoods of the Resource Poor Farm Household			
6.1.1	Characterization of the farming systems research and development site. 2021-2022	To identify geographical location, physical, biological, social and economic conditions, infra-structural condition, existing farming systems, resource situation, problem and prospect of the FSRD site	Physical, biological, social and economic conditions, infra-structural condition, existing farming systems, resource situation, general problems of the FSRD site will be generated.	200
6.1.2	Monitoring the whole farm activities of intervened farmers. 2022-2025	i) To determine the livelihood improvement of the farmers resulted from the intervention of farming systems technologies ii) To determine the resource flow in the selected farm family	The income of the farm families under different farm categories will be increased through intervention of improved farming systems technologies	1000
6.1.3	Integration of mustard/potato/pulses in the rice-based cropping system under different rice growing environments. 2021-2025	i) To increase the system productivity by inclusion of mustard, potato and pulses in the existing cropping systems ii) To identify the impact of large scale demonstration of improved cropping pattern on farmers livelihood improvement	Improved cropping pattern will be disseminated in the trial area which will increase the income of the farm families.	300
6.1.4	Farmers' participatory evaluation of recently released BRRI varieties for Boro and T. Aman season. 2021-2025	i) To find out the suitable T. Aman and Boro varieties for different rice growing ecosystems ii) To disseminate these varieties for achieving higher production over the existing varieties	Suitable newly released T. Aman and Boro varieties will be adopted in the trial area which will increase the cropping system productivity.	200

6.1.5	Farmers' participatory quality seed production of recently released BRRI varieties for Boro and T. Aman season. 2022-2025	i) To demonstrate the quality rice seed production technique at farm level ii) To expedite the delivery systems of good quality seeds among the farmers'' community	Quality rice seed will be available at farmer's level.	200
6.1.6	Field days and farmers' training on different farming systems activities. 2021-2025	To motivate farmers for adoption of FSR technologies ii) To improve farmers' knowledge base on improved agricultural production system	Farmer's knowledge about new technologies will be increased.	1200
	Agronomy Division			
	Proposed Research Programme 2022-2023			
Sl. No.	**Programme area/Project (Duration)**	**Major Objective**	**Expected Output**	**Annual budget Thousand Tk.**
	Program Area: Crop Soil Water Management			
	Seeds and seedlings			
1	Effect of Nanoparticles to reduce Chilling Stress in Rice	To mitigate chilling stress of rice seedling by nano ZnO	An effective alleviation method against chilling stress in rice seedling will be identified.	100
	Fertilizer Management			
2	Growth stage based nitrogen management for yield maximization of Hybrid rice	1. To investigate hybrid rice response to different nitrogen fertilizer levels and timing of application at different growth stage. 2. To determine nitrogen use efficiency of BRRI hybrid rice varieties.	Growth stage based nitrogen management strategy for maximizing yield of hybrid rice will be developed.	150
3	Effect of BRRI Biofertilizer on growth and yield of BRRI dhan34	To find out the benefit of BRRI biofertilizer with inorganic fertilizer for BRRI dhan34.	The effect of BRRI biofertilizer on growth and yield of BRRI dhan34 will be identified.	120
4	Effect of BRRI Biofertilizer on growth and yield of	To find out the benefit of biofertilizer with inorganic fertilizer for Boro varieties.	The effect of BRRI biofertilizer on growth and yield of	160

	Boro varieties		rice will be identified.	
5	Effect of foliar application of chitosan on growth, yield and physio-biochemical characteristics of rice under salinity stress	1. To investigate the effect of chitosan on growth, yield and Na: K ratio of rice under salinity stress. 2. To evaluate biochemical indicators like proline and MDA content	An effective salinity alleviation method using chitosan will be developed.	100
	Weed Management			
6	Performance of herbicide to reduce Azolla infestation from rice field	To reduce the abundance of Azolla from rice fields	Appropriate Azolla management option will be developed.	100
7	Residue analysis of herbicide, insecticide and fungicide in soil, water and rice under irrigated ecosystem	To analyze the MRL of pesticides in water, soil and rice	The MRL of pesticide in water, soil and rice will be identified.	180
8	A survey on weed diversity in different Agricultural regions of Bangladesh	1. To know the weed management option and to formulate recommendation of standard herbicides with appropriate doses in different ecosystem. 2. To formulate a weed database with major or minor weeds in rice ecosystem. 3. To investigate the distribution and severity of weed flora prevailing in different agricultural regions. 4. To identify the emerging weed problems and directions for improved weed management in upland and lowland rice.	Emerging weed problems and directions for improved weed management in upland and lowland rice will be identified.	300
9	Assessment of yield and economic losses in rice due to weeds in Bangladesh	1. To find out the actual yield loss in farmers level due to weed infestation. 2. To find out the potential yield loss in different locations of Bangladesh.	The actual yield loss in farmers' level of Bangladesh due to weed infestation will be identified.	300
	Yield Maximization			
10	Effect of	1. To study contributions of	The best production	180

	agronomic factors for maximizing yield of BRRI developed PQR rice type like Katarivog (BRRI dhan70) and Jesmin (BRRI dhan80) through developing sustainable production management protocol in T Aman season	agronomic factors to maximize yield of BRRI dhan70 and BRRI dhan80 in T Aman season 2. To find out and recommend the best production management protocol for sustainable higher yield of BRRI dhan70 and BRRI dhan80 in T Aman season	management protocol for higher yield of BRRI dhan70 and BRRI dhan80 will be developed.	
11	Effect of some agronomic factors for maximizing yield (10 t/ha) of long duration BRRI variety (BRRI dhan92) through developing sustainable production management protocol in Boro season	1. To study some agronomic factors for high yield contribution of long duration BRRI variety (BRRI dhan92) in Boro season 2. To find out the best production management protocol for sustainable higher yield of the long duration variety.	The best production management protocol for higher yield of BRRI developed long duration variety will be developed	150
12	Maximizing yield of BRRI developed new varieties through influencing Agronomic Critical Factors in Boro seasons at BRRI farm Gazipur.	1. To 1. study the effect of Agronomic most critical factors for yield maximization of newly BRRI developed Boro varieties 2. To find out and recommended the most appropriate Agronomic critical factors packages for yield maximization of newly BRRI developed Boro varieties.	The best production management protocol for higher yield of BRRI developed some new varieties will be developed	150
13	Effect of agronomic factors for maximizing yield (7 t/ha) of medium duration BRRI variety	1. To study contributions of some agronomic factors to high yield of a medium duration variety (BRRI dhan94) in T Aman season 2. To find out the best production management protocol for	The best production management protocol for higher yield of BRRI dhan94 will be developed.	150

	(BRRI dhan94) through developing sustainable production management protocol in Aman season	sustainable higher yield of medium duration T Aman BRRI variety (BRRI dhan94).		
	Soil health management			
14	Biodegradation of pesticides in soil using selected microbial strains	1. To measure the effect of pesticides on bacterial growth 2. To estimate the rate of pesticides degradation by the soil microbes	Pesticide degradable soil bacteria will be identified and their degradation process will be explored.	100
15	Screening of Salt-tolerant bacteria isolated from coastal saline soils in Bangladesh	To screen out potential salt-tolerant bacterial strains isolated from coastal saline soil.	Potential salt-tolerant bacterial strains will be screen out.	100
16	Characterization and identification of salt-tolerant PGPR isolated from coastal saline soils in Bangladesh	1. To characterize the potential salt-tolerant bacterial strains. 2. To identify the salt-tolerant bacterial strains using 16S rRNA gene sequence.	The beneficial plant growth-promoting traits of the selected bacterial strains will be identified.	110
17	Effect of PGPR and chemical fertilizers on the growth and yield of salt-tolerant rice under saline soil condition	1. To observe the effect of PGPR inoculation on plant salinity tolerance. 2. To observe the effect of nitrogen and gypsum application on salt-stress reduction in plants.	Integrated approach on soil salinity management could be developed.	150
	Molecular Trait Management			
18	Physiological, biochemical and molecular mechanisms of salinity tolerance in rice	To get insight into the physiological, biochemical and molecular mechanisms by which BRRI developed salt-tolerant varieties respond to the salinity stress	The possible salinity tolerance mechanism of BRRI developed salt-tolerant varieties will be identified,	120
19	Agronomic and bio-molecular traits of BRRI released drought tolerant rice	1. To identify enzymatic activities in drought stress of rice. 2. To identify drought tolerant mechanism of BRRI released variety for enhancing agronomic productivity	Drought tolerant mechanism of BRRI released variety for enhancing agronomic productivity will be explored.	130

	Soil Science Division			
	Proposed Research Programme 2022-2023			
Sl. No.	**Project title and Expt.**	**Objectives**	**Expected out put**	**Annual budget (Thousand Tk.)**
	Program Area: Crop Soil Water Management			
	Sub-sub program I:			
I.	**Soil Fertility and Plant Nutrition**	**To assess fertility status of rice growing areas and determine optimum fertilizer requirement**	**Fertility Assessment of Rice Soils and Nutrient use efficiency in rice**	3450.0
	1.1 Improvement of rice yield and NUE through nano fertilizer and zeolite amendment (Boro 2018)	• To assess yield and N use efficiency by urea-HA nanohybrid and natural zeolite plus prilled urea (PU) over PU	Improved N use efficiency	500.0
	1.2. Screening of N use efficient rice genotypes (Boro 2021 to till)	• To find the N use efficient genotypes • To find the agronomic traits related to efficient N management • GWA mapping of selected NUE lines	N use efficient rice genotype will be identified	UKRI GCRF SANH Project
	1.3. Management interventions to improve NUE and reduce N losses in typical rice cropping system of Bangladesh (Boro 2020)	• To quantify the fate of N fertilizer (crop, soil and losses) and NUE under various N managements for double rice cropping. • To develop locally based mitigation options that can be compared within plot based experiments.	Pathway of N fertilizer loss determined and best management practice will be identified	UKRI GCRF SANH Project
	. 1.4 Nitrogen response to ALART material in Boro and T. Aman season (ongoing)	• To find out the optimum doses of N for Bacterial Blight ALART materials	Optimum doses of N for ALART materials will be determined	400.0
	1.5. Updating of nitrogen doses for	• To identify optimum nitrogen dose for MV rice	Economic doses of N for MV rice will be	200.0

	modern rice varieties (T. Aman, 2017 to till)		determined	
	1.6. Phosphorus response study of newly released rice varieties (Boro 2017-18 to till)	• To investigate the performance of MV rice under deficient soil P levels	Economic doses of P for MV rice will be determined	200.0
	1.7. Potassium fertilizer management in rice-based cropping patterns in Old Himalayan Piedmont Soil (2022 to open)	• To identify the K deficiency in soil • To determine the K contribution for different crops (rice, wheat, maize etc.) • To increase crop yield & maintain soil fertility especially for K in the respective cropping pattern	Economic doses of K for MV rice will be determined in K deficient soil	400.0
	1.8. Effect of nitrogen and potassium rates on modern rice cultivation (2003 to till)	• To find out the suitable combination of N and K for MV rice cultivation • To study the N and K dynamics in soil and plant	Interaction of N and K will be determined	400.0
	1.9. Nutrient management for growing four crops in a year (T. Aus 2016 to till)	• To evaluate total productivity • To assess changes in soil fertility i.e. nutrients depletion or mining	Nutrients management of 4crops will be determined	500.0
	. 1.10. Effect of different micro and ficial nutrients on growth and yield of rice (T. Aman 2019 to till)	• To study the effect of micro & beneficial nutrients on growth and yield of rice • To observe the interactions among the different micro nutrients and beneficial nutrients • To study the effect of micronutrients and beneficial nutrients on soil biochemical properties	Micro and beneficial nutrients on growth and yield increased in rice will be determined	200.0
	.1.11. Effect of long-term rice	• To determine the changes occurred in soil carbon and	Effect of long-term rice farming on the	200.0

	farming on the changes of soil nutrient status of BRRI Farm (Boro 2020 to till)	plant nutrient status of BRRI farm soil • To develop a soil fertility map • To devise a nutrient dynamics model to estimate the nutrient status on long term basis	changes of soil nutrient status of BRRI Farm will be determined	
	1.12. Soil profile study of the Research farms of different BRRI Regional stations (Boro 2020 to till)	• To characterize the soils of the research fields of the BRRI Regional stations; • To classify the soils according to the world soil classification system. • To identify the soil fertility capability classification	Soil profile of Cumilla, Barisal, Sirajganj, Rangpur and Satkhira will be studiued	300.0
	1.13. Regional Yield Maximization Trial (RYMT) under Recommended Management Practices (ongoing)	• To validate Integrated Improved Management Practices (IIMP) compared with BRRI Recommended Practices (Control) • To maximize proper filling of grains in a panicle under IIMP	Integrated Improved Management Practices (IIMP) will be validated	150.0
	Sub-sub program 2:			
2.	**Identification and management of nutritional disorder**	**To determine upcoming nutritional disorders in rice under intensive rice cultivation with different fertilizer management practices**	**Upcoming nutritional disorders in rice under intensive rice cultivation will be determined**	620.00
	2.1. Long-term effect of organic and inorganic nutrients on yield and yield trend of lowland rice (Boro 1985 to till)	• To evaluate changes in soil physical, chemical and biological properties • To determine management options for solution of soil problem(s)	Effect of organic and inorganic nutrients management practices on soil health determined	200.0
	2.2. Long-term missing element trial at BRRI regional station (Boro 2013-14 to till)	• To determine nutrient mining problem on soil fertility and its influence on rice yield • To find out nutrient management options for correcting soil problems • To monitor soil fertility changes over time	Nutrient mining problem and nutrient management options for correcting soil problems will be determined	300.0

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	2.3. Effect of intensive rice cropping on rice yield under continuous wetland condition (Boro, 1971)	• To evaluate soil fertility and rice yield changes over time • To find out mitigation options of soil health	Effect of intensive rice cropping (three season) on rice yield and soil health determined	120.0
	Sub-sub program 3: Integrated nutrient management (INM)			
3.	**Integrated nutrient management for intensive rice cropping**	**To increase rice productivity with sustainable soil health.**	Impact of INM practices will be determined	1800.0
	3.1. Integrated nutrient management for double and triple rice cropping for maximizing productivity (Boro 2008-9 to till)	• To improve land productivity and soil health under intensive cropping system.	INM for double and triple rice cropping for maximizing productivity will be determined	200.0
	3.2. Increase rice yield through organic and inorganic amendment (ongoing)	• To study the effect of vermicompost and silicon on rice grain yield while maintaining soil health	Rice yield will be improved through organic and inorganic amendment	200.0
	3.3. Soil Management to maximize the yield of newly released rice varieties (ongoing)	• To maximize rice yield through organic and inorganic amendments while maintaining soil health in BRRI farm	Newly released rice varieties yield will be maximized through soil management	400.0
	3.4. Estimation of C and N flows in a village and developing methods to improve soil C and N within the system (ongoing)	• To estimate major C and N flows in a village • To develop treatments to improve soil C stock and N use efficiency in the farming system	C and N flows in a village will be determined	500.0
	3.5. Nutrient management under CA in double rice	• To identify the nutrient requirement of crop and to improve soil health under CA	Nutrient management under CA will be determined	NUMAN Project

	cropping system at AEZ 26 (ongoing)	practice in Boro-Fallow-T. Aman cropping pattern.		
	3.6.Good Agriculture Practices (GAP) to Increase Rice Productivity (Boro 2022 to open)	• To obtain quality and safe rice • To sustain crop yield • To maintain soil health & minimize environmental pollution	Quality and safe rice will be produce through Good Agriculture Practices (GAP)	500.0
	Sub-sub program 4: Soil and Environmental Problems			
4.	**Soil and Environmental problem**	**To ameliorate soil & environment related problems**	**Soil and environment related problems will be ameliorate**	300.0
	4.1. Increase Rice Yield through Vermicompost in Coastal Land (ongoing)	• To assess the impact of vermicompost on the yield of rice in coastal saline soil	Impact of vermicompost for the improvement of rice yield in Coastal land will be determined	NUMAN Project
	4.2. Effect of biochar on rice yield and soil health on problem soils (T. Aman, 2019)	• To study the effect of biochar on rice yield, nutrient use efficiency and soil health of charland soils	Impact of biochar for the rice yield improvement in Char land will be determined	200.0
	4.3.Effect of chitosan (CTS) coated urea in saline soil for rice cultivation (Boro 2022 to open)	• To determine soil nutrient mineralization (N, P, K, Ca) due to CTS coated urea application	Soil nutrient mineralization (N, P, K, Ca) due to CTS coated urea will be determined	100.0
	4.4. Effects of fertilizer and varietal management on mitigating greenhouse gas emissions from rice cultivation in South-western coastal ecosystems (ongoing)	• To quantify GHG emissions from rice field under different fertilizer and varietal management • To develop a technology for increased crop productivity with reduced negative environmental impacts. • To develop country specific Emission Factor and national GHG inventory.	Effects of fertilizer and varietal management on mitigating GHG emissions from rice cultivation in South-western coastal ecosystems will be determined	GoB ADP Program
	Sub-sub program 5: Soil Microbiological Studies			
5	**Soil Microbiology**	**To improve soil biology and**	**Soil biology and**	1600.0

	and Biofertilizer	**health**	**health will be improved**	
	5.1. Evaluation of BRRI-organic fertilizer for the improvement of rice yield and soil health (Boro 2016 to till)	• To evaluate the efficacy bio-organic fertilizer for growth and yield of rice. • To assess the impact of bio-organic fertilizer on soil health	Synthetic N and K fertilizer use in rice production will be reduced	500.0
	5.2. Microbial characterization of different AEZs soil and formulation of biofertilizer for rice cultivation in acid and saline soil (Boro 2019 to till)	• To assess soil bio-physico-chemical properties of different AEZ's of Bangladesh and characterize potential plant growth promoting bacteria (PGPB) • To develop bio-fertilizer using potential microbes for rice cultivation in acid and saline soil	Soil biology of different AEZ will be determined	500.0
	5.3. Bio-Coated Urea and TSP: a new approach to improve N fertilizer use efficiency (NUE) and crop yield (Boro 2022 to open)	• To formulate a bio-coated urea and Bio-coated TSP fertilizer • To determine its efficacy in soil-plant system	Bio-Coated Urea and TSP fertilizer will be developed as a new approach to improve N fertilizer use efficiency (NUE) and crop yield	300.0
	5.4.Bio-coated urea fertilizer for rice yield enhancement in saline soil (Boro 2022 to open)	• To formulate a bio-coated urea fertilizer and • To determine its efficacy in soil-plant system	Efficacy of bio-coated urea in soil-plant system will be determined	300.0
	Irrigation and Water Management Division			
	Proposed Research Programme 2022-2023			
Sl. No.	**Program area/Project (Duration)**	**Major Objectives**	**Expected output**	**Annual budget (000 Tk)**
	Program Area: Crop Soil Water Management			
	Sub-Program: Water Management **Sub-Sub Program I: Improvement of Water Use Efficiency in Irrigated Agriculture**			

1	Water Requirement	• To generate water efficient technologies for rice cultivation		
1.1	Determination of physical and hydraulic properties in different soil types 2015-To be continued	• To document the important soil physical properties in different soil profiles • To develop a soil moisture characteristics curve	Documentation of important soil physical properties for efficient water management	100
1.2	Automated Alternate Wetting and Drying Irrigation System for Rice production 2018-23	• To automate conventional implementation of AWD technology • To make the AWD method easy and user-friendly • To save irrigation water by precise water level monitoring	Reducing irrigation cost by 30% water saving	200
1.3	Problems and potentials for crop productivity improvement through water management in the Hilly areas 2015-2023	• To identify problems & potentials of water resources development for agriculture and livelihood improvement in the Hilly area • To recommend suitable water management options	Identification of water resources suitable for agriculture of the area.	100
1.4	Study on water stress tolerance capacity for different advanced rice genotype of BRRI 2015- To be continued	• To quantify water-stress tolerance capacity for different varieties • To determine yield of varieties under different water stress condition	Scaling of water stress tolerance capacity (WSTC) of a particular variety.	100
1.5	Performance evaluation of the proposed rice varieties under different water regimes 2019-To be continued	• To study performance of the proposed rice varieties under different water regimes • To evaluate suitable water regimes for proposed lines/varieties of rice	Determination of water stress tolerance capacity of proposed lines/variety	200
1.6	Improving soil-water availability for crop production in char land by amendment practices	• To determine soil physical properties and water holding capacity of root zone soil layers • To measure soil-water retention curves of the soil layers and determine their parameters	Soil water holding capacity of char land improvement.	100

	2019-23			
1.7	Determining minimum irrigation water requirement of rice at different regions of Bangladesh through water balance from on-farm demand and model simulation 2019-23	• To measure yield response of rice to irrigation application base on on-farm demand and simulated irrigation requirement • To figure out variation in irrigation water requirements among different treatments	Gap between simulated and on-farm demand-based water requirements	200
1.8	Optimization of water use efficiency through sub-irrigation system in fine (light) textured soils of Bangladesh 2020-25	• To design and installation of a sub-irrigation system in a particular field based on soil physical and hydraulic properties • To estimate the total annual water balance in the sub-irrigation system • To evaluate the performance of sub-irrigation system	Feasibility of subirrigation and sprinkler irrigation system in rice cultivation	300
1.9	Irrigation water requirement and rainfall utilization for delayed transplanting of boro rice in different locations of Bangladesh 2021-24	• To find out the variation of irrigation water requirement in relation to the delayed transplanting • To maximize the rainfall utilization and to reduce the groundwater withdrawal	Optimum planting window based on maximum utilization of rainfall water.	300
1.10	Impact of different perched water level on yield performance, water use and grain nutritional quality of rice 2022-25	• To assess the water use in different growth stags in relation to various water treatments • To assess the grain nutritional quality pattern in rice at different perched water levels	Assessment of different perched water level effects in grain quality and yield performance	200
	Sub–Sub Program II: Utilization of Water Resources in Rainfed Environment			
2	Water Management for rice cultivation in climate change situation	To obtain optimum rice yield under climate change situation		
2.1	Validation of	• To determine drought using	Drought forecasting	200

	agricultural drought forecasting for mitigating drought in T. Aman rice at Kushtia region 2021-23	forecasted rainfall and evaporation • To determine suitability of drought model for forecasting		
2.2	Irrigation scheduling of rice (Oryza sativa L.) based on weather forecasting in Gazipur 2019-22	• To predict water demand through water balance simulation model for rice cultivation • To recommend the better method for irrigation scheduling of rice	Irrigation water requirement determination through weather forecasting	100
	Sub-Sub Program III: Land Productivity Improvement in the Coastal Environment			
3	Land and Water Resources Use for Sustainable Crop Production	• To increase land and water productivity for improved food security and livelihoods in the coastal zones		
3.1	Assessment of water resources availability suitable for irrigation to increase crop production in tidal areas of Barisal region 2015-To be continued	• To monitor the dynamics of surface water salinity in the dry season at different locations of Barisal region • To assess the suitability of water for irrigated crop cultivation.	Availability of suitable water in different rivers.	100
3.2	Water resources assessment during dry season crop cultivation in selected polders of coastal region 2017-To be continued	• To delineate suitable water resources during dry season. • To assess the cultivated area by different cropping pattern based on water resources	Available suitable water in river and canals	100
3.3	Saline water irrigation strategies for boro rice cultivation in the coastal saline area 2021-24	• To find out the saline water irrigation management options for Boro rice cultivation • To quantify the ionic stress on plant shoot and root under saline water treatments	Saline water irrigation management options for rice production in the saline area	400
	Sub-Sub Program IV: Sustainable Management of Water Resources			
4	Surface and	• To identify the aquifer		

	Ground Water Assessment	characteristics and quality of groundwater in Bangladesh and its relationship with rainfall		
4.1	Monitoring of groundwater fluctuation and safe utilization in different geo-hydrological regions 1979-To be continued.	• To determine the fluctuation of groundwater level over time and its relationships with rainfall, and • To determine water quality for assessing suitability for irrigation.	Determination of declination rate of groundwater level in different regions of Bangladesh	100
4.2	Conjunctive use of wastewater and fresh water for irrigation in Boro rice cultivation 2020-22	• To determine suitability of wastewaters for Boro rice cultivation. • To analyze rice grain sample for heavy metal uptake.	Proper use of wastewater	100
4.3	Effect on percolation losses and groundwater recharge due to weak plough-pan formed under long term conservation agriculture 2020-22	• To determine amount of irrigation water contributed through deep percolation to ground water recharge under SP and CT. • To determine the depth and vicinity of the nearest aquifer.	Amount of irrigation water contributed to the ground water recharge	200
4.4	Evaluation of available groundwater resources for sustainable crop production in selected locations of Bangladesh 2020-23	• To evaluate fluctuation pattern of GWL • To determine the GWL depletion trend	Withdrawal and recharge pattern of groundwater	200
4.5	Assessment of surface and groundwater quality for irrigation in selected locations of Bangladesh 2019-22	• To determine the surface and groundwater quality parameters • To determine the suitability of groundwater for irrigation	Safe irrigation water sources identification	100
4.6	Change in surface water bodies and	• To find out the relationship between surface water storage and	Change in surface water storage bodies	200

	its impact on groundwater recharge in Barind region of Bangladesh 2021-25	groundwater recharge • To figure out the options increasing surface water storage for enhancing GW recharge and sustainable crop production	and its relation to groundwater recharge	
4.7	Surface water receding pattern in relation to boro rice establishment in haor region of Bangladesh 2021-25	• To determine weekly/fortnight water receding pattern and a contour map showing the water receding area • To determine suitable establishment period for escaping flash flood damage of Boro rice	Water receding pattern and suitable planting period for Boro rice to escape early flash flood	100
4.8	Reuse of domestic household water for crop production at BRRI farm, Gazipur 2021-25	• To find out the quality of domestic wastewater for irrigation • To assess the opportunities of domestic wastewater for irrigation	BRRI Residential area wastewater can be reused for irrigation purpose.	300
4.9	Assessing on-farm water-use efficiency of BRRI research farm, Gazipur 2021-25	• To find out present irrigation management status of BRRI farm • To suggest plan for efficient irrigation management plan for BRRI farm	Plan to improve water use efficiency of BRRI farm, Gazipur	100
4.10	Present status and potentiality for increasing rice cultivation in surface water irrigation projects of Bangladesh 2021-24	• To determine the present efficiency of major irrigation projects • To figure out the improvement options for surface water utilization	Improvement options of surface water irrigation project	100
4.11	Groundwater use potential for supplemental irrigation for Boro rice production in the haor areas 2022-23	• To assess the groundwater availability for Boro rice cultivation • To install tubewells for irrigation development • To reduce yield loss due to water stress at the later stage of Boro rice • To assess potential command area for the installed STW	Productivity increasing by mitigating water stress at the reproductive phase of rice	500
4.12	Effectiveness of Surface laid PVC pipe irrigation for	• To develop a portable water conveyance system under undulating condition of haor	Crop coverage expansion by improving irrigation	200

	Boro rice cultivation in the haor areas 2022-23	areas • To minimize irrigation water loss in distribution systems of the LLP schemes • To increase irrigation coverage per unit time	facilities for Boro production	
	Sub-Sub Program V: Utilization of Renewable Energy			
5	Renewable energy for irrigation	• To identify some renewable energy sources for irrigation		
5.1	Development of a low-cost DC solar water pump for irrigation in Bangladesh 2021-23	• To use a permanent magnet brushless DC motor for operating solar water pump • To determine economic feasibility of the pump for rice cultivation	Optimum panel and pump size	150
5.2	Feasibility assessment of solar pump utilization for irrigation purpose in Chattogram region 2021-22	• Present irrigation scenario, sources of irrigation water and energy for irrigation pumps • Suitability to use of solar energy in irrigation	Present status of irrigation scenario using solar pump	100
	Sub-Sub Program VI: Climate Change Impact Assessment and Adaptation Techniques Development			
6	Climate change assessment and adoption	• To develop suitable water management techniques and practices in rice cultivation for mitigating and adopting climate change impacts		
6.1	Effect of irrigation suspension on mitigating greenhouse gas emission in irrigated rice cultivation 2021-2024	• To determine irrigation requirement and yield of Boro rice under varying practices • To assess irrigation suspension practices on reducing global warming potential	Suitable irrigation management for reducing global warming potentials	0.50
	Sub-Sub Program VII: Technology Validation in the Farmers' Field (different donor funded projects)			
7	Water Management Technologies Demonstration and Dissemination at	• To increase the irrigation efficiency and water productivity by appropriate management of water through BRRI developed water management technologies		

	Farmers' Field			
7.1	Modeling climate change impact on agriculture and developing mitigation and adaptation strategies for sustaining agricultural production in Bangladesh 2020-23	• Assessment and characterization of climatic variability, vulnerability, and extreme events for agri-production under climate change	• Crop performance scenarios & yield forecasting tool • Microbial population dynamics and biological soil health • Adaptation strategy for CC • Yield reduction and compensation behavior with temperature rise and CO_2 levels • C & N footprint for rice production • Genotype/breed specific coefficients • Genetic coefficients of rice, wheat, maize and potato (10 varieties) for CC study • GHG emission factor and GWP • Mitigation options for GHG emission reduction • Carbon sequestration and management decision for sustained production • Socio-economic vulnerability index of climate change	KGF
7.2	Intervention in surface water utilization through integrated minor irrigation schemes for escalating water	• Expansion of Boro rice cultivation in selected area utilizing less saline surface water. • Assessment of suitable water resources for crop planning in selected polders.	• A GIS based water resources assessment map for each polder area will be produced at the end of the project. The map will	KGF

	and land productivity in coastal region 2021-24	• Increasing water use efficiency by adopting on-farm water saving technologies.	show crop water requirement basis water resources availability for different crops throughout the year.	
7.3	Increasing cropping intensity in the coastal Barishal and Khulna region through water resources and soil salinity management 2020-23	• Increasing cropping intensity and improving farmer's livelihood by integrated management of less surface water and soil salinity in the coastal Barishal and Khulna region.	• Fallow land will be under Boro cultivation by using surface water. • Land and crop productivity will be increased with double and triple cropping. • Improved irrigation and water management technologies will be adopted. • High yielding and stress tolerant rice and non-rice crop upscaling contribute national food security	GoB
7.4	Upscaling of improved water management practices for sustainable productivity in the Haor areas 2022-24	• To document the existing agricultural water management practices for identifying problems and potentials to attain higher productivity in the haor areas. • To assess the effect of water stress on the yield of Boro rice and find suitable measures to overcome the problem. • To demonstrate performance of suitable water management technologies (AWD irrigation, use of lay flat hose pipe etc.) for the improvement of irrigation efficiency and optimum crop yield. • To evaluate the suitability of direct seeding method for labour & water saving and early harvest	• Higher and sustainable rice production • Adoption of improved water management technologies • Water saving by around 23% • Policy recommendation for agricultural development of haor areas	KGF

		of Boro for escaping flash flood; and • To explore the possibility of increasing crop production by further irrigation expansion through improved water management innovations in the haor areas.		
7.5	Mitigating risk and scaling-out profitable cropping system intensification practices in the salt-affected coastal zones of the Ganges delta 2021-25	• To improve the productivity of existing crops and cropping intensity of the system by growing crops in the dry season – particularly in areas where dry-season cropping. • To improve productivity and increase cropping intensity by better water and salinity management and reduction of climatic risks. • Enhancing individual and institutional capacity building to undertake future independent research in the coastal zone.	The possible outcomes will be used for boosting up the livelihood of the people of salt-affected coastal zone.	ACIAR-KGF
	Plant Physiology Division			
	Proposed Research Programme 2022-23			
Sl. No.	**Program Area/Project**	**Major Objectives**	**Expected output**	**Annual Budget (Thousand Taka)**
	Program Area: Crop Soil Water Management			
1	Exploring new sources and advance breeding lines for salinity tolerance from at seedling stage	To identify salt tolerant advance breeding lines/genotypes at seedling stage.	New sources of Salinity tolerant donor and tolerant advance breeding lines	100
2	Characterization of Rice Germplasm for Whole Growth Period at Different Salinity Stress	1. To identify the level of tolerance of the tested lines. 2. To identify the safe level of soil and water salinity for growing the genotypes. 3. To estimate the yield and yield components.	New sources of salt tolerance rice genotypes at reproductive stage which may be as donor parents	150
3	Characterization of	1. To identify the level of tolerance	New sources of salt	150

	advanced breeding lines for whole growth period at different salinity stress	of the tested lines. 2. To identify the safe level of soil and water salinity for growing the genotypes. 3. To estimate the yield and yield components.	tolerance rice genotypes at reproductive stage which may be released as a salinity tolerant variety or used as donor parents.	
4	Characterization of hybrid varieties for whole growth period at different salinity stress	1. To identify the level of tolerance of the tested varieties. 2. To estimate the yield and yield components.	Salinity tolerance ability of hybrid rice varieties will be identified	150
5	CRISPR-Cas9 mutagenesis of the OsRR22 gene for improving salinity tolerance of rice	To increase salinity tolerance via CRISPR-Cas9-targeted mutagenesis of the transcription factor gene OsRR22.	New salinity tolerant rice through genome editing	2
6	Identification of rice germplasm/advanced breeding lines for two weeks flash flood submergence tolerance	To identify tolerant germplasm/advanced breeding line for two weeks of complete submergence at vegetative stage.	New sources of submergence tolerance germplasm/advanced breeding line.	50
7	Screening for stagnant flooding tolerance of Germplasm/advanced breeding lines at whole growth period during T. Aman season	1. To identify tolerant germplasm for water stagnation condition 2. To observe tillering ability under water stagnation conditions	Identification of medium stagnation tolerant genotypes	100
8	Study of the relationship between SNORKEL (Sk1 and Sk2) genes and Sub1 gene through mutagenesis of Sub1 gene in rice	i. To know the relationship between Sub1 and SNORKEL gene after the loss of function of Sub1 gene ii. To observe the elongation ability of the mutants under submerged condition after the loss of function of Sub1 gene	Relationship between SNORKEL (Sk1 and Sk2) genes and Sub1 gene will be discover under submerged condition	200
9	Confirmation of performance for ALART/ RYT	To evaluate of ALART/ RYT /AYT materials under control drought condition in the net house.	Drought tolerant genotypes will be identified	100

	/AYT materials under drought stress at reproductive stage			
10	Screening germplasm for drought tolerance at reproductive phase	To identify rice germplasm tolerant to drought stress at reproductive phase.	The best tolerant germplasm to be further used as donor parent for developing future drought-tolerant varieties.	125
11	Evaluation of previously selected germplasm under drought stress at reproductive phase in the rain-out shelter	To find out the correlation of field performance of tested genotypes with the performance under control drought condition in the rain-out shelter	Drought tolerant genotypes will be confirmed under control condition.	150
12	Physiological and biochemical characterization of advanced breeding lines under drought stress at reproductive phase	1. To assess the effect of drought stress on growth and yield of the tested genotypes 2. To identify the physiological traits associated with drought tolerance.	Mechanism of tolerance of tested genotypes will be determined	200
13	Characterization of rice germplasm under drought stress at reproductive phaseusing SSR marker	To study the genetic diversity of the germplasm.	Genetic similarity and cluster analysis together with drought tolerance ability of the germplasm will be identified	200
14	Screening for high temperature induced spikelet fertility QTL introgression lines under controlled conditions.	To identify high temperature tolerant lines under controlled condition	High temperature tolerant introgression lines	150
15	Screening for high temperature induced spikelet fertility QTL introgression lines under controlled conditions.	To identify high temperature tolerant lines under controlled condition	High temperature tolerant introgression lines	150
16	Observational yield	To identify high yielding and	Heat tolerant version	100

	trial of high temperature induced spikelet fertility introgression lines in the BRRI dhan28 and BRRI dhan29 backgrounds.	homogenous lines having phenotypic similarity with respective recipient parents.	of BRRI dhan28 and BRRI dhan29	
17	Marker assisted introgression of high temperature induced spikelet fertility QTL (qHTSF4.1) in the background of BRRI dhan48 and BRRI dhan62	To develop high temperature induced spikelet fertility QTL (qHTSF4.1) introgression lines for the Aus and T. Aman (short duration) seasons	Heat tolerant version of BRRI dhan48 (Aus) and BRRI dhan62 (Short duration T. Aman) variety	150
18	Screening rice germplasm lines for heat tolerance	To identify new heat tolerant donor and advanced breeding lines.	New sources of heat tolerant donor for high temperature stress (35-38 $^{\circ}$C) during flowering can be identified and breeding lines will be selected for future program.	150
19	Exploring new sources of cold tolerance from BRRI Gene Bank collections at seedling stage	To identify rice genotype which can tolerate low temperature at seedling stage.	Identification of new sources of cold tolerant germplasm	100
20	Screening of advanced breeding lines for seedling stage cold tolerance (TRB-Project)	To identify advanced breeding lines which can tolerate low temperature at seedling stage.	Identification of cold tolerant advanced breeding lines	100
21	Characterization and evaluation of	To characterize rice genotypes at natural cold condition.	Identification of cold tolerant advanced lines.	100

	some selected rice genotypes for cold tolerance			
22	Screening of advanced breeding lines for cold tolerance	To identify cold tolerant advanced breeding lines for whole growth period.	Identification of cold tolerant advanced lines.	100
23	Effect of polythene covering on seedling raising in Boro season	To identify the most suitable technique for protecting Boro rice seedling from cold injury through optimizing number of opening on polythene cover seedbed	Identification of healthy seedling raising technique under cold sterility.	100
24	Lodging tendency in BRRI developed T Aman varieties	To determine the lodging characters of five BRRI varieties at different planting time.	Lodging tolerance of the tested varieties will be known	100
25	Photo-sensitivity test of some advanced breeding lines	To know the photo-sensitivity of advanced breeding lines and recently released T. Aman varieties	Photo-sensitivity of the tested genotype would be known.	100
26	Photo-sensitivity test of some local germplasm	To know the photo-sensitivity of advanced breeding lines and recently released T. Aman varieties	Photo-sensitivity of the tested genotype would be known.	50
27	Effect of harvesting time on yield and grain quality of rice	1. To determine the suitable harvesting time at dry and wet season 2. To estimate the yield loss and grain quality due to early and late harvesting.	Percent yield loss and grain quality will be known at difference harvesting time.	100
28	Partitioning of dry matter and growth rates at different phenophases in rice varieties with variable doses of nitrogen	To investigate the effect of variable levels of nitrogen on dry matter accumulation and partitioning of rice varieties at different growth period.	Contribution of nitrogen to dry matter production and its effect on growth rates and finally on yield.	150
29	Reduction of pre-harvest sprouting of rice through chemical spraying	To reduce the pre-harvest sprouting spikelet in rice panicle	PHS preventing technology	150
30	Generation of male sterile rice line for two-line hybrid system by editing	1. To generate a novel thermo-sensitive genic male sterile line by editing TMS5 gene via CRISPR/Cas9 for two-line hybrid	Two line male sterile line	150

	TMS5 gene using CRISPR/Cas9 system	system, 2. To evaluate the suitability of the TGMS line in two-line hybrid breeding program		
31	Study the effect of exogenous applications of ABA on rice grain development at high night temperature condition	To evaluate the effects of ABA on multiple rice yield-determining parameters an to determine	Yield maximization at high night temperature condition.	150
32	Investigation of anatomical and photosynthetic differences of C3 and C4 species	1. To identify leaf anatomical differences between C3 (rice) and C4 (maize, sorghum, kaoun, shayma, sugarcane) species. 2. To explore differences of photosynthetic related parameters between C3 (rice) and C4 (maize, sorghum, kaoun, shayma, sugarcane) species.	Anatomical and photosynthesis differences of C3 and C4 species.	200
33	Optimizing chlorophyll fluorescence imaging system for photosynthetic efficiencies of C3 and C4 species in different stress condition	1. To identify photosynthetic efficiencies of C3 and C4 species under low CO_2 stress. 2. To explore photosynthetic efficiencies of rice under salinity, submergence and drought stresses.	Optimized chlorophyll fluorescence imaging protocol for stress detection of C3 and C4 species	200
34	Automatic weather station data collection and storage	Weather data collection, delivery, reporting, and storage for automatic weather stations.	Archiving of digital weather data from BRRI headquarter and different regional stations.	150
	Entomology Division			
	Proposed Research Programme 2022-23			
Sl. No.	**Programme area/ Project (Duration)**	**Major Objective**	**Expected output**	**Annual budget Thousand Tk.**

	Program Area: Pest Management			
1.	**Project: Survey & Monitoring of Rice Arthropods.**	To determine the incidence and abundance patterns of insect pests and their natural enemies at BRRI farm and in different AEZ's for better management of rice pests.		
	1.1 Pest monitoring in BRRI farm. **Duration:** Long term	To study the insect pests and their natural enemy incidence at BRRI farm and to create a database to develop a forecasting system.	Insect pests and natural enemies status will be known from different rice habitats and that will help to developed models or forecast method in a long term.	150,000.00
	1.2 Insect pests and natural enemy in light trap. **Duration:** Long term	To study the pest and their natural enemy incidence patterns in rice fields and to create a database to develop a forecasting system.	Incidence and peak abundance of insect pests and natural enemies will be throughout the year and help to update the existent databank.	150,000.00
	1.3 Survey and monitoring of rice arthropods and yield loss estimation. **Duration:** Long term	To know the present status of insecticide application. To reduce insecticide application in rice production. To assess the yield loss due to infestation of rice insect pests.	Awareness will be developed among the farmers on judicious use of insecticide. Yield loss (if any) will be determined by insect pest infestation. It will help to farmers to take right decision on insecticide application.	200,000.00
2.	**Project: Bio-ecology of Rice Insect Pest and Natural Enemy.**	To study the ecology and development of insect pest of rice.		
	2.1 Behavioral adaptation of RLR in different weather condition. **Duration:** Mid term	To identify the effects of temperature on life cycle of rice leafroller.	Population outbreak of rice leafroller will be known in global warming situation.	200,000.00

3.	**Project: Biological Control of Rice Insect Pests.**			
	3.1 Conservation of natural enemies through eco-engineering **Duration:** Mid term	To reduce insecticide application in rice production. To save environment from insecticidal pollution. To conserve natural enemies through ecological engineering approaches.	It will reduce pesticide dependency to control insect pest in rice field. It improves biological control of pests by enhancing Arthropods biodiversity.	200,000.00
	3.2 Study on entomogenous fungi to control BPH. **Duration:** Mid term	To isolate the fungi from naturally infected insects. To explore suitable media for mass production of the entomogenous fungi and its use in BPH management.	Naturally available bio-control agent for BPH management will be known**.**	200,000.00
	3.3 Study on the biology of green mirid bug an egg predator BPH **Duration:** Mid term	To know the biology and life cycle of green mirid bug.	Biology and life cycle of green mirid bug will be known**.**	100,000.0
4.	Project: Crop Loss Assessment.	To determine relationship between pest damage levels and yield losses.		
	4.1 Stem borer species abundance, assessing yield losses & management in rice. **Duration:** Mid term	To study the relative abundance of different species of rice stem borers and to determine the yield loss due to their damage.	Relative abundance of different species of rice stem borers and yield reduction due to their infestation will be known.	150,000.00
5.	**Project: Evaluation of Chemicals and Botanicals against Rice Insect Pests.**	To evaluate the effectiveness of different botanicals and determine efficacy of different insecticides against major rice insect pests.		

	5.1 Test of different insecticides against major insect pests. **Duration:** Long term	To evaluate the effectiveness of commercial formulations of different insecticides against major insect pests of rice.	New, and effective insecticide(s) will be determined and recommended to Sub-PTAC and PATC for registration.	300,000.00
	5.2 Use of nanoparticle to control rice insect pests. **Duration:** Mid term	To develop nano-particle based pest management in rice To reduce chemical pesticide load in environment.	Effective nano-particles for rice insect pest management will be identified which will reduce insecticide use in rice field.	300,000.00
	5.3 Effect of insecticides on natural enemies of rice insect pests. **Duration:** Mid term	To identify relatively safer insecticides for using (if needed) in IPM program.	Environment-friendly insecticides will be identified for insect pest control.	100,000.00
	5.4 IRAC susceptibility test method for BPH and WBPH adult **Duration:** Mid term	To evaluate the efficacy of selected insecticides group against BPH/WBPH.	Environment-friendly insecticides dose will be identified for insect pest control.	200,000.00
6.	**Project: Insecticide Toxicology**	To detect insecticide residue in rice.		
	6.1 Residue analysis of different insecticide in rice by using LCMS. **Duration:** Long term	To detect insecticide residues in rice hull, bran and polished rice. To establish monitoring and guidance on safe use of insecticide in rice field.	The results would contribute to know the residues of different insecticides in rice.	500,000.00
	6.2 Development and validation of analytical methods for multiple pesticide residue determination in rice grain using Liquid Chromatography with Tandem Mass	To develop and validate a multi-residue analytical method for the analysis of chlorantraniliprole, chlorpyrifos, thiamethoxam, carbofuran and isoprocarb in rice grain using QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) extraction coupled to LC-MS/MS.	Suitable analytical methods for detect and quantify chlorantraniliprole, thiamethoxam, chlorpyrifos, carbofuran and isoprocarb from rice grain will be developed.	500,000.00

	Spectrometry (LCMS/MS). **Duration:** Long term			
	6.3 Development and validation of analytical methods for multiple pesticide residue determination in rice husk and rice bran using Liquid Chromatography with Tandem Mass Spectrometry (LCMS/MS). **Duration:** Long term	To develop and validate a multi-residue analytical method for the analysis of chlorantraniliprole, thiamethoxam and imidacloprid in rice husk and bran by using QuEChERS (Quick, Easy, Cheap, Effective, Rugged and Safe) extraction coupled to LC-MS/MS.	Suitable analytical methods for detect and quantify chlorantraniliprole, thiamethoxam, chlorpyrifos, carbofuran and isoprocarb from rice husk and rice bran will be developed.	500,000.00
7.	**Project: Host Plant Resistance.**	Identification of resistant sources against rice insect pests.		
	7.1 Screening of rice germplasm, advance line against BPH, WBPH, GLH. **Duration:** Long term	To identify resistant rice germplasm against major insect pests.	Resistant sources against major insect pests could be found.	400,000.00
	7.2 Development of BPH resistance rice introgression lines through marker assisted selection. **Duration:** Mid term	Development of elite donor for BPH resistance breeding program. Development of new breeding lines for BPH resistance.	varieties. Newly developed lines could be used in the insect resistance breeding program.	400,000.00
	7.3 Identification of BPH resistant sources from rice germplasm. **Duration:** Mid term	To characterize BPH resistant germplasms using BPH resistant linked markers.	BPH resistant materials will be characterized as a source for further use in developing pre-breeding materials.	400,000.00
	7.4 Suppression of serotonin synthesis	To develop insect resistant rice	Brown planthopper and yellow stem borer	500,000.00

	in rice using CRISPR Cas9 for insect control. **Duration:** Mid term	variety. To reduce insecticide dependency in pest management.	resistance rice variety will be developed.	
	7.5 Resistance mechanism in BRRI dhan33 to gall midge **Duration:** Mid term	Identify the gall midge resistance gene in BRRI dhan33. Identify polymorphisms in parental lines, BRRI dhan33 and BRRI dhan49 and isolate the responsible gene by genetic linkage analysis.	Gall midge resistance mechanism in BRRI dhan33 will be discovered. Novel gall midge resistance gene from BRRI developed variety will be identified.	200,000.00
	7.6 Pyramiding three BPH resistance genes (Bph2, Bph20, & Bph32) using marker-assisted selection in BRRI dhan89 **Duration:** Mid term	Develop three/two gene pyramiding lines using marker assisted breeding. Evaluate the effects of BPH-resistant lines carrying different R genes after infestation with BPH.	Two/three gene pyramiding lines using marker assisted breeding will be developed.	400,000.00
8.	**Project: Molecular Biology of Rice Insect Pests.**	To dissect the genomic diversity of rice arthropods.		
	8.1 Molecular characterization of stem borer in Bangladesh based on COI analysis **Duration:** Mid term	To assess a gene diversity of stem borer in Bangladesh. To know the impact of geographic location in stem borer genomic structure.	Genetic diversity of YSB will be known. Identify new or invasive species.	200,000.00
	8.2 Gene drive to control Nilaparvata lugens. **Duration:** Mid term	To assess a gene drive strategy to control the insect pest that threatens the staple food production in Bangladesh.	New crop protection approach will be established and invasive pest like BPH (if any) would be eliminated from Bangladesh.	500,000.00
	8.3 Isolation and identification of	Identification of sex pheromone of rice stem borer.	Identify pheromone components which	1500,000.00

	sex pheromone of stem borer. **Duration:** Mid term	Development of pheromone based stem borer management in rice field. Reduction of chemical insecticide dependency.	are essential for the attraction of stem borer males and use them crop protection will be known.	
9.	**Project: Integrated Pest Management**	Reduction of chemical pesticide and safe food management.		
	9.1 Use of sex pheromone in corporation with other IPM tools to control leafroller and stem borer. **Duration:** Mid term	To test the efficacy of sex pheromone against leafroller and stem borer in rice field. To control rice leaf roller and YSB without insecticide.	Rice leafroller and yellow stem borer will be controlled in rice field by pheromone trap. Reduce insecticide use in rice field.	100,000.00
10.	**Project: Vertebrate Pest Management**	Management of rat in the rice field.		300,000.0
	10.1 Evaluation of available rodenticides against rice field rats. **Duration:** Mid term	To find out effective dose of rodenticide to control rat.	Field efficiency of rodenticide available in the market will be evaluated in rice field.	200,000.00
	10.2 Use of Watching Tower to manage rice rats **Duration:** Long term	Sustainable management of rat facilitating owl watch tower for predation	Sustainable management of rat facilitating owl for predation Owl feeding composition in rice ecosystem will be known	100,000.00
	10.3 Testing birth control medicine/botanicals to rice field rat **Duration:** Mid term	To reduce birth rate of rice field rats	Field population of rice rat will be reduced at tolerable / expected level.	200,000.00
	Plant Pathology Division			
	Proposed Research programme 2022-2023			

Sl. No.	Programme area/Project (Duration)	Major Objective	Expected Output	Annual Budget Thousand Tk.
	Program Area: Pest Management			
I.	**Survey and monitoring of rice diseases**			
	1.1 Survey and monitoring of rice diseases in selected areas	1. To investigate the present status of different rice diseases in different climatic environments 2. To update disease crop calendar	Update status of different rice disease based on different climatic condition will be Identified	600
	1.2. Monitoring of rice diseases in HIZR and healthier rice under confined condition	To determine the incidence and severity of rice diseases on the genotypes	Disease level in different advanced genotypes of healthier rice will be identified	100
	1.3. Digitization of Surveillance System and Data Storage	To develop a web-based rice disease information platform in Bangladesh	Web based disease surveillance method will be developed	100
II.	**Population structure and biology of major pathogens**			
	2.1. Improvement of differential system for rice blast disease in Bangladesh	1. To select new differential blast isolates 2. To identify candidate resistant gene(s) or source(s) 3. To monitor regularly of the evolution of new races	Emergence of rice blast pathogen will be observed	50
	2.2. Studies on host range of blast pathogen	To determine the pathogenicity of all the isolates to rice and the pathogenicity of rice isolates to foxtail millet and barely	Host specification of blast pathogen in different sources will be identified	800
	2.3. Identification of the source of infection of rice false smut disease	1.To identify whether seeds are the carrier of the pathogen or not 2. To identify whether soil is the carrier of the pathogen or not	Soil or seed source of false smut disease of rice will be defined	100
II.	2.4 Isolation of potential microbes for controlling	To identify potential fungi/bacterial for controlling major weeds of rice	Potential microbes will be identified to control weeds in rice	50

	major weeds of rice		ecosystem	
	2.5. Etiology, Epidemiology and Management of Bacterial Panicle Blight (BPB): An emerging and climate sensitive rice disease in Bangladesh	To conduct a details study on bacterial panicle blight (BPB) disease in Bangladesh	Causal effect, epidemiology and biology of Bacterial panicle blight pathogen will be determined	200
	2.6. Determination of variability of rice tungro virus strain of Bangladesh	To check the variability of rice tungro virus of Bangladesh	Variation of tungro virus strain will measured	100
	2.7. Identification of emerging viral diseases and its causal organisms in Bangladesh	To identify the new viruses by based on phenotypic symptoms and molecular markers	Emerging new races of viral diseases will be characterized	100
	2.8. Development of Long-Term Preservation Technique of Xanthomonas oryzae pv. oryzae	To isolate, purify and preserve the Xanthomonas oryzae pv. oryzae obtained from infected rice leaves	Permanent preservation method for Bacterial leaf blight diseases pathogen will be developed	50
III.	**Disease resistance and molecular studies**			
	3.1 Linkage and QTL mapping of blast resistance in BR16	To identify significant QTLs with linked marker for blast resistance in BR16	Blast resistant QTLs will be identified from BR16 rice variety	100
	3.2. Studies on the genetic mechanism of rice blast resistance in BRRI dhan33	1. To know the genetic mechanism of rice blast resistance in BRRI dhan33 2. To identify marker data for developing blast and gall midge resistant varieties through MAS	Blat disease resistant pathway in BRRI dhan 33 will be identify	200

	3.3. Detection of novel loci underlying rice blast resistance by integrating a genome-wide association study	To detect the new sources/loci/genes of blast resistance from native germplasm	new sources/loci/genes of blast resistance from native germplasm will be defined	200
III.	3.4. Phenotypic and genetic characterization of local aromatic germplasms against blast.	To characterize their resistance pattern for developing blast resistant aromatic pre breeding materials.	Characterization of local aromatic germplasms against blast will be observed	100
	3.5. Development of Rice Blast Resistance by CRISPR/Cas9-Targeted Mutagenesis of the OsERF922	To develop durable blast resistant variety or line against the major races by targeted mutagenesis (CRISPR/Cas9).	Durable blast resistant rice variety will be developed by following CRISPR/Cas9 approach	500
	3.6. Introgression of blast resistance gene(s) into BRRI dhan58 using marker assisted backcross breeding	To introgress blast resistant genes (both Pi9 and Pb1) in high yielding BRRI dhan58	Pi9 and Pb1 resistant gene will be introgressed in BRRI dhan58	400
	3.7. Development of durable broad spectrum BB and Blast resistant variety through mutagenesis by CRISPR/Cas9 system	To develop broad spectrum resistant rice variety against Bacterial Blight and Blast disease using CRISPR/Cas9 system	Durable broad spectrum BB and Blast resistant variety will be developed through CRISPR/Cas9	1000
	3.8. Development of blast resistant varieties using differential system and molecular markers	To develop blast resistant varieties for Bangladesh	Blast resistant advanced lines or variety will be developed	300
	3.9. Development	To develop blast and bacterial blight (BB) resistant Pre-breeding	Major disease	200

	of Multiple diseases resistant (blast and bacterial blight) pre-breeding materials through MAS (Short duration)	materials in the background of BRRI dhan28	resistant advanced lines will be developed	
	3.10. Development of Multiple diseases resistant (blast and bacterial blight) pre-breeding materials through MAS (Long duration)	To develop blast and bacterial blight (BB) resistant Pre-breeding materials in the background of BRRI dhan28	Blast and Bacterial blight resistant pre breeding materials will be developed	200
	3.11. Gene pyramiding of bacterial blight resistance genes into popular BRRI varieties	To introgress bacterial blight (BB) and blast resistant genes in the background of BRRI dhan49, BRRI dhan63 and BRRI dhan81	Multiple gene contained blast and bacterial blight resistanyt rice variety will be developed	200
III.	3.12. Exploring new sources of resistance and pyramiding blast resistant gene into susceptible rice varieties (Short duration)	1. To find out new source of major resistant gene(s) against blast disease in the native land races 2. To introgress of known resistant genes and/or gene pyramiding to develop durable blast resistant variety	New germplasms will be identified and multiple resistant gene contained variety will be developed	1000
	3.13. Exploring new sources of resistance and pyramiding blast resistant gene into susceptible rice varieties (Long duration)	1. To find out new source of major resistant gene(s) against blast disease in the native land races 2. To introgress of known resistant genes and/or gene pyramiding to develop durable blast resistant variety	New germplasms will be identified and multiple resistant gene contained variety (Long duration) will be developed	1000
	3.14. Transcriptome analysis for the detection of novel	To identify novel resistant gene of bacterial and sheath blight disease	Novel bacterial blight and sheath blight resistant gene will be	800

	bacterial blight and sheath blight resistant gene in Gunshee, landrace		detected through transcriptome analysis.	
	3.15. Development of prebreeding materials for tungro resistance	To develop tungro resistant advanc lines	Tungro resistant advanced line will be developed	200
	3.16. Morphological and molecular characterization of upland rice germplasm against major rice diseases	1. To know different diseases status of germplasm under natural infection. 2. To identify best genotype/s against disease and for better yield 3. To know diversity of upland germplasm using molecular markers	Emerging disease resistant line will be identified based on morphology and molecular analysis	100
	3.17. Screening and observational yield trial of tungro resistant materials in green house and tungro hotspot area	To evaluate the performance of tungro resistant advanced lines	Disease resistance of Tungro resistant materials will be checked in net house and hot spot area.	500
III.	3.18. Evaluation of tungro resistant materials (INGER and advanced lines)	To evaluate the performance of tungro resistant advanced lines	Tungro resistant advanced materials will be identified from INGER materials.	500
	3.19. Screening of INGER materials against blast disease	To identify the source of resistance against blast disease of rice	Blast resistant advanced materials will be find out from INGER materials.	100
	3.20. Screening for Bacterial Blight and Blast Resistance (TRB)	To screening advance genotypes or germplasm against BB and Blast diseases	Bacterial blight and blast resistant materials will be identified from TRB materials.	1700
	3.21. Screening of germplasm against sheath blight	To identify the source of resistance against sheath blight disease of rice 1.To investigate the Bakane	Sheath blight resistant germplasms will be find out.	50

	disease 3.22.Screening of rice germplasms against Bakanae disease 3.23. Screening of advance breeding lines and INGER materials against Bacterial Blight disease	resistant germplasms To find out promising BB resistant breeding lines	Bakanae resistant germplasms will be identified Bacterial blight resistant lines will be detected from INGER materials.	50 50
IV.	**Epidemiology, yield loss and grain quality studies**			
	4.1. Development of Early Warning System of rice blast disease 4.2. Development of inoculation technique for false smut disease 4.3. Validation of the presence of the pathogen of rice false smut disease in seeds through molecular identification 4.4. Crop Loss Assessment of rice due to major diseases in Bangladesh	To aware the rice growers at least 5 days earlier of blast disease infection To develop artificial inoculation technique of rice false smut disease To validate the previous findings To calculate the actual crop loss due to major diseases in Bangladesh.	Early warning disease forecasting model will be developed for rice growers Artificial inoculation technique will be developed for false smut disease False disease source will be identified through molecular approach Crop loss due rice disease will be estimated	300 30 50 750
IV.	4.5. Development of a model for yield loss estimation due to sheath rot disease of rice 4.7. Determination of afla toxins by	To develop a model applicable for yield loss estimation in farmers field due to sheath rot disease 1.To determine the population of different storage fungi at different	Yield loss model for sheath rot disease will be developed Based on moisture content in storage afla	50 200

	storage fungi at different moisture level in storage condition	moisture level 2. To determine the production of aflatoxin by A. flavus	toxin level will be determine.	
	4.8. Detection of major bacterial pathogens of rice by multiplex PCR	To develop a multiplex PCR (mPCR) assay for rapid and simultaneous detection of major rice bacterial pathogen	Rapid identification of Xanthomonas spp in rice will be determine through multiplex PCR.	50
	4.9. Grain quality study of rice blast and false smut infected seed	Quality evaluation of rice grain as affected by blast and false smut disease	Quality of blast and false smut infected seed will be measured.	50
	4.10. Genotype and environmental interaction on neck blast incidence in blast prone area	To understand the pattern of neck blast incidence in relation to variety and environment	Major causal component of Neck blast disease will be determined	100
	4.11. Health status of rice seed in Bangladesh	To know the health conditions of rice seeds available from public and private sectors, and farmers' seed as well	Health status of different common seed sources will be determined	50
	4.12. Nano-diagnostic technique for detection of rice seed borne pathogens	To evaluate using nanoparticles in the extraction method of DNA from rice seeds compared with traditional detection	Extraction DNA from rice seed through nano particles approach will be developed	100
V.	**Management of rice Diseases**			
	5.1. Sustainable Management of Blast, Sheath Blight and Bacterial Blight Diseases of Rice through Nano-particles (NPs)	1.To prepare effective nano-particles using organic and inorganic sources in Bangladesh. 2.To find out the effective nano-particles to evaluate their efficacy 3.To reduce the recommended fungicides quantity for different disease management	Cost effective nano particles will be identified to control major rice diseases.	40000
	5.2. Development	To develop a quick responsive	Rapid response	100

	of modified microwave assisted nano particles for rice blast disease management in Bangladesh	chemical for blast disease management	fungicides will be idenbtified	
	5.3. Chemical control of sheath rot and false smut disease of rice under different planting time	1. To find out effective fungicide/s against Sheath rot and false smut disease. 2. To identify most conducive time for sheath rot disease development	Effective fungicides for sheath rot and false smut will be identified.	100
	5.4. Bakanae disease control with integrated approach	To find out the effective integrated approaches for bakanae disease management	Integrated control measures will be identified for Bakanae disease	50
	5.5. Determination of residual effect of trifloxystrobin, tebuconazole and tricyclazole in rice grain under field conditions	To find out the pesticide residue in pesticides sprayed rice	Residual effect of fungicides in rice grain will be determined	350
	5.6. Residual effect of Azoxystrobin and Difenocanazole on microbial community in phylloplane and phyllosphere of rice plant	1.To determine the impact of chemicals on microbial colony 2. To determine the residue of chemical in soil and plant	Residual effect of fungicides in rice field soil will be determined	200
V.	5.7. Study on entomopathogenic fungi to control BPH, Leaf folder and stem borer	1. To isolate the fungi from naturally infected insects 2.To know the pathogenicity of entomogenous fungi against BPH 3. Mass production of the entomogenous fungi and its use for BPH management	Isolation and pathogenicity of hematophagous fungi for BPH, leaf folder and stem borer will be done	50
	5.8. Evaluation of	1. To find out effective fungicide/s	Effective fungicides	250

	new chemicals against blast, bacterial blight, sheath blight, false smut, Sheath rot and bakanae diseases of rice	against false smut 2. To identify most conducive time for false smut disease development.	will be detected against major disease of rice	
VI.	**Technology Transfer**			
	6.1. Training on integrated management of rice diseases 6.2. Dissemination of Integrated Blast Management Package at Farmer's Field	To build up farmer's awareness on integrated rice disease management To build up farmers' awareness on rice blast disease management and minimize the yield loss	Farmers will be aware about epidemiology and yield loss of major rice diseases Farmers will learned integrated method to control blast disease	1000 100
	Farm Machinery and Postharvest Technology Division & Workshop Machinery and Maintenance Division			
	Proposed Research Programme 2022-23			
Sl. no.	**Programme area / Project (Duration)**	**Major Objective**	**Expected output**	**Annual budget Thousand Tk.**
	Programme Area: Farm Mechanization and Postharvest Technology			
	Sub-Programme 01: Farm Machinery and Postharvest Technology			
	1.0 Development of Agricultural Machines			
1.1	**Evaluating and modifying of BRRI developed machines** (1998 -Continued)	• To verify the quality of BRRI machines • To identify the functional problems of farm machines • To improve the performance of farm machines	The performance of the machine will be improved	50,000/-
1.2	**Design and development of a head feed power thresher** (2017 -Continued)	• To design and develop a head feed thresher • To conduct a test of the thresher for its performance and capacity • To compare the performance with the existing threshers	Head feed thresher will be available and straw will remain intact in threshing.	1,00,000/-
1.3	**Design and development of**	• To assess combine harvester field performance, general condition,	The prototype of a whole feed mini	15,00,000/-

	whole feed mini combine harvester (2017 -Continued)	durability, repair and maintenance requirements • To check the fuel consumption and hourly production of the combine harvester under different working conditions • To obtain operator views regarding the suitability of combine harvester.	combine harvester will be available for Bangladesh condition	
	1.4: Development of a forward-motion manual rice transplanter (2019 -Continued)	• Design and fabrication of a manually operated forward-motion rice transplanter • Performance evaluation of the developed rice transplanter	• Forward motion type manually operated rice transplanter will be available for small-scale farmers' of Bangladesh. • Transplanting cost and time will be reduced. • Line-to-line and plant-to-plant distances will be maintained according to the farmers' demand.	4,00000/-
1.5	**Development, validation, and adoption of power weeder for wetland rice cultivation (2019 -Continued)**	▪ To develop and multiplication of the power weeder ▪ To demonstration, validation and adaptation the weeder in different locations under different rice seasons ▪ To reduce the rice production cost	• Field trials of the BRRI power weeder will create a positive impact on the usefulness of the technology. • Appropriate technology will be available for weeding operations in line transplanted rice fields. • Large-scale use of mechanical weeder will be increased. However, the difficulties for timely weeding will be reduced.	
1.6	**Design and**	• To design and develop a power-operated rice transplanter	A walking type of power-operated rice	25,00000/-

	development of walking type power operated rice transplanter (2019 -Continued)	• To test the performance of the developed rice transplanter	transplanter will be introduced to the end-users	
1.7	**Design and development of a diesel engine-operated high-speed hydro-tiller for marshy land** (2021 -Continued)	• To design a variable power transmission mechanism of the diesel engine-operated hydro-tiller • To design a rotary casing of a hydro tiller suitable for marshy land • To develop a prototype based on engineering design • To evaluate the prototype in different soil conditions	Diesel engine-operated suitable hydro tiler will be developed for the end users to cultivate marshy land easily	3,00,000/-
1.8	**Postharvest loss assessment of whole and head feed combine harvester under different soil conditions** (2021 -Continued)	• To assess the loss of grain. • To identify a suitable operating system to minimize the loss.	The maximum postharvest losses of the mechanical harvester in rice will be identified for providing information to reduce postharvest losses.	50,000/-
1.9	**Determination of optimum seed rate for Hybrid rice variety for mechanical transplanting in Bangladesh** (2021 -Continued)	• To identify the optimum seed rate for different hybrid rice varieties to produce quality seedlings and minimize the missing hills of mechanical transplanting. • To identify suitable seedling adjustment options to dispense the optimum number of seedlings per stroke (seedlings hill^{-1}) of the rotary picker of rice transplanter.	Optimum seed rate and suitable seedling adjustment options to dispense an optimum number of seedlings per stroke (seedlings hill^{-1}) of the rotary picker of rice transplanter. will be known for different hybrid rice varieties to produce quality seedlings	50,000/-
1.10	**Development of mat-type seedling using a hydroponic technique** (2021 -Continued)	To develop a mat-type seedling using a hydroponic technique Performance test of developed seedling for rice transplanter	Using the Hydroponic technique to develop mat-type seedlings can save the topsoil of the field.	3,00,000/-
1.11	**Identification and fabrication of fast-moving spare**	▪ To list down the fast-moving spare parts of the different make and model	The use of combine harvesters is rising steadily in the	10,00,000/-

	parts of combine harvester and rice transplanter enhancing sustainable mechanization in Bangladesh (2022 -Continued)	▪ To identify the strength and quality of the major parts ▪ To take initiative for the fabrication of the parts	country. At the moment, farmers are given access to the different makes and models of the combine harvester, but because spare parts frequently fail, their operation is frequently interrupted during the peak period of the season. This study will enable the development of commercially viable parts for domestic production identifying the fast-moving parts. Additionally, it would increase the number of local small business owners, lessen reliance on imports, and make combine harvester viable and sustainable.	
1.12	**Ground pressure and bearing capacity of combine harvester in different soil conditions** (2022 -Continued)	• To estimate ground pressure and bearing capacity of combine harvester in different soil conditions • To estimate the required force in cutting, threshing, cleaning, bagging rice through combine harvester	Traficability of a combine harvester can be determined	2,00,000/-
1.13	**Design and development of self-propelled fertilizer deep placement applicator** (2022 -Continued)	• To design, fabricate and develop a power-operated fertilizer deep placement applicator using an existing developed manual applicator. • To compare with other fertilizer applicators.	• Power-operated fertilizer applicator will be developed • Manually fertilizer deep placement difficulties will be solved. • Losses of fertilizer in different ways will be reduced.	3,00,000/-

			• Farmers can save time and costs for fertilizer deep placement with a power-operated fertilizer applicator.	
1.14	**Modification of the power transmission system of the BRRI hydro-tiller** (2022 -Continued)	• To detect the causes of frequent tearing of hydro tiller chain • To modify the power transmission system for increasing the longevity of the hydro tiller	The longevity of the hydro tiller will be increased.	50,000/-
1.15	**Design and development of a single-row wetland power weeder** (2022 -Continued)	• To design, fabricate and develop a power-operated single-row weeder suitable for weeding both in a row-to-row and line-to-line of the lowland and upland fields (line and without line sowing). • To evaluate its performance in the different multi-crop fields. • To compare with other dry and wetland paddy weeders	• Power-operated single-row paddy weeder, as well as a multi-crop weeder, will be developed • Uprooting weeds from plant to plant will be done mechanically. • Extra labor for uprooting weeds from line to line of paddy fields will be reduced. • Farmers can save time and costs for weeding with power-operated machines.	1,00,000/-
1.16	**Design and development of a self-propelled multi-rows power weeder for both wet and dry land condition** (2022 -Continued)	• To design and fabricate the self-propelled weeder • To evaluate the weeding performance in different locations • To improve the developed weeder based on evaluation • To reduce the weeding cost in rice production	• A suitable power weeder for line transplanted dry and wet land crops will be available at the farmers' level. • Human drudgery in weeding will be reduced by introducing a high-capacity user-friendly power-operated feeder	5,00,000/-

	2.0 Milling and Processing Technology			
2.1	**Design and development of solar dryer** (2019 -Continued)	▪ To design, fabricate and develop a solar dryer ▪ To compare with traditional sun drying of paddy	A new solar dryer will be available for grain drying.	2,00,000/-
2.2	**Test, evaluation and modification of rubber roll de-husker for commercial use** (2015 -Continued)	• To modify and development of a rubber roll de-husker • To evaluate the performance of paddy de-husker	The combination of de-husker and polisher will be an alternate milling system of auto rice milling.	3,00,000/-
2.3	**Drying and tempering effect on Kernel Strength and milling recovery of the parboiled and un-parboiled Paddy** (2022 -Continued)	• To determine the kernel strength of paddy in terms of drying and tempering effect. • To make a relation between kernel strength and milling recovery.	Optimum moisture content for maximum milling yield and head rice recovery will be accomplished	6,00,000/-
	3.0 Development of stores and storage technology			
3.1	**Effect of ageing on milling performance of premium quality rice** (2017 -Continued)	• To observe the milling performance of BRRI dhan50 at different aging	The appropriate milling age of BRRI dhan50 will decide	2,00,000/-
3.2	**Validation and adaptation of hermetic storage structure in the household level in Bangladesh** (2020 -Continued)	• To compare the performance of traditional and hermetic storage technologies in rice storage	Appropriate rice seed storage techniques will be identified	100,000/-
3.3	**Effect of the different storage structures of milled rice in long-term storage** (2021 -Continued)	• To find out the suitable storage structure • To investigate the influence of moisture content on storage time • To observe the prevalence of insect/ diseases infestation of storage time • To determine the effect of length of storage time on the quality of milled rice	Suitable storage structure and length of storage time on the quality of milled rice	1,00,000/-
	4.0 Renewable Energy Technology			

4.1	**Study the briquette production from rice by product** (2019 -Continued)	• To prepare briquettes from rice straw and husk • Characterization of different briquettes originated from agricultural residue • To measure the calorific value of the briquettes	Good-quality briquettes will be produced	1,00,000/-
4.2	**Study on solar energy utilization for small agricultural machinery** (2019 -Continued)	• To design a mechanism of solar energy utilization • To evaluate the performance of the developed machine	• Solar-operated power chopper will be developed. • Operation costs will be reduced	3,00,000/-
4.3	**Design, development and performance evaluation of briquetting machine using rice husk with different rations of maize steam** (2021 -Continued)	• To design and develop a briquetting machine using rice husk with different ratio of maize steam. • To determine the physical and combustion properties of the final product. • To evaluate the performance of the briquetting machine.	A low-cost briquetting machine will be developed and alternative fuel will be introduced instead of wood.	2,00,000/-
	5.0 Popularization of BRRI-developed farm machinery and Postharvest technology			
5.1	**Industrial and farm-level extension of BRRI machinery and Postharvest technology** (1998 -Continued)	• To create awareness and demonstrate the benefit of using BRRI machines among the farmers • To motivate the local entrepreneurs to manufacture BRRI-developed machinery	The entrepreneur will be developed to use the machine on the rental system.	10,00,000/-
	6.0 Precision Agriculture			
6.1	**Detection of rice leaf diseases and early diagnosis using faster regional convolutional neural networks (R-CNN)** (2022 -Continued)	• To develop and enhance an image processing system and deep learning techniques to advance the agricultural sector.	PA is a new advanced method in which farmers provide optimized inputs such as water and fertilizer to enhance productivity, quality, and yield.	1,00,000/-
6.2	**Application of machine learning techniques in predicting**	• Development of machine learning techniques in predicting standardized precipitation evapotranspiration index (SPEI)	The best agricultural drought-predicted model will be developed in the most	1,00,000/-

	agricultural drought: A regional examination of Bangladesh (2022 -Continued)		drought-prone area.	
	Agricultural Economics Division			
	Proposed Research Programme 2022– 2023			
Sl. No.	**Programme area/Project (Duration)**	**Major Objective(s)**	**Expected Output**	**Annual Budget Thousand Tk.**
	Program Area: Socio Economics & Policy			
1	**Farm Level Adoption and Evaluation of Modern Rice Cultivation in Bangladesh** **Status: Routine work**	✓ To determine the region-wise adoption rate of different MVs in Aus, T. Aman and Boro seasons, ✓ To estimate the yield of different modern and local rice varieties in different seasons; ✓ To determine the socio-economic and varietal constraints of MVs in different regions.	Region wise adoption rate of MVs and LVs in Aus, Aman and Boro seasons be determined. Socio-economic and varietal constraints will be elicited.	**300**
2	**Prospect and Constraints to Adoption of BRRI Released Modern Rice Varieties in Bangladesh: A Case of Jashore District** **Status: New**	✓ To identify the drivers and constraints of adoption of BRRI released varieties; ✓ To delineate the prospect of BRRI varieties for large scale dissemination at the farm level.	Drivers and constraints of BRRI released varieties in Jashore will be determined.	**200**
3	**Assessment of Popular Local Rice Varieties Cultivated in Different Seasons in Bangladesh** **Status: New**	✓ To determine the adoption status of local varieties ✓ To analyze the comparative profitability of popular local and HYV rice; and ✓ To identify the reasons for cultivating these local cultivars.	Adoption Status of LVs will be determined. Comparative profitability of popular LVs and HYV will be analyzed. Reasons for cultivating LVs will be identified.	**150**

4	**Estimation of Costs and Return of MV Rice Cultivation at the Farm Level** **Status: Routine work**	✓ To determine the costs and returns of MV Aus, T. Aman and Boro rice cultivation in Bangladesh, ✓ To estimate the factor and income share of MV rice cultivation in different seasons; and ✓ To evaluate the changes in costs and returns and inputs utilization pattern over the years.	Profitability of MV Aus, T. Aman and Boro rice cultivation will be analyzed. Factor and income share of MV rice cultivation in different seasons will be estimated.	**300**
5	**Adoption Determinants, Profitability and Resource Use Efficiency of Stress Tolerant Rice in Selected Areas of Bangladesh: An Econometric Approach** **Status: Continued**	✓ To delineate adoption status and yield of stress tolerant and hybrid rice varieties; ✓ To estimate profitability and resource use efficiency of stress tolerant rice varieties; and, ✓ To identify factors influencing adoption decision of stress tolerant and hybrid rice varieties.	Adoption status and yield of stress tolerant and hybrid rice varieties will be illustrated. Profitability and resource use efficiency of stress tolerant rice varieties will be estimated.	**100**
6	**Socio-economic Vulnerability of Climate Change and Adaptation Strategies of the Rice Farm Households in the Coastal and Flood Prone Areas of Bangladesh** **Status: Continued**	✓ Assessing perception of the rice farm households about climate change and variability; ✓ Identification of adaptation strategies and barriers to adaptation of the vulnerable households in the face of climate change issues; and, ✓ Assessment of livelihood vulnerability of households in hazards-prone areas.	Perception of the rice farm households about climate change and variability will be assessed. Adaptation strategies and barriers to adaptation of the vulnerable households in the face of climate change issues will be identified.	**100**
7	**Producers' Welfare Loss in Bangladesh: An Assessment of Rice Market Distortion** **Status: Continued**	✓ To estimate the supply function of rice; ✓ To measure the producers' surplus change in terms of (i) procurement and real price, (ii) farmers' expected and real price; and, ✓ To formulate policy guidelines towards minimizing producers' welfare for sustaining rice	Supply function of rice will be estimated. producers' surplus change in terms of (i) procurement and real price, (ii) farmers' expected and real price will be measured.	**100**

		production in Bangladesh.		
8	**Comparative Profitability of Rice and its Competing Enterprise in Selected Areas of Bangladesh** **Status: New**	✓ To assess the profitability of rice and selected non rice enterprises ✓ To find out the reasons for cultivating non rice enterprises ✓ To estimate optimum allocation of resources for rice and non-rice enterprise ✓ To explore the ways of ensuring profitability of rice production	Profitability of rice and selected non rice enterprises will be assessed. Optimum allocation of resources for rice and non-rice enterprise will be estimated.	**100**
9	**Livelihood Status and Food Security Analysis of Garo Tribe in Bangladesh** **Status: New**	✓ To analyze the socio-economic status of the Garo people; ✓ To study the rice consumption (calorie intake) level of the sample households	Livelihood status of the Garo people will be analyzed. Rice consumption (calorie intake) level of the sample households will be studied.	**100**
10	**Understanding Climate Variability, Adaptation and Market Insights of Rice in *Haor* Ecosystems** **Status: Continued**	✓ To dig out the perception of farmers about climate change ✓ To figure out farmers' coping and adaptation strategies to climate change ✓ To derive policy implication.	Perception of farmers about climate change in *Haor* areas will be identified. Farmers' coping and adaptation strategies to climate change will be figured out.	**100**
11	**Adoption status of BRRI Developed Different Technologies (other than rice seed) in Bangladesh** **Status: New**	✓ To know adoption status of BRRI developed different technologies in selected areas ✓ To identify the reasons of adoption and non-adoption of those technologies	Adoption status of BRRI developed different technologies in selected areas will be determined. Reasons of adoption and non-adoption of those technologies will be identified.	**150**
12	**Assessing the Effect of Subsidy on Mechanization in Rice Production in Bangladesh** **Status: New**	✓ To assess the profitability of rice production under subsidized machinery; ✓ To draw some policy guidelines for effective mechanization in rice production.	Profitability of rice production under subsidized machinery will be assessed. Policy guidelines for effective mechanization in rice production will be drawn.	**200**
	Agricultural Statistics Division			

	Proposed Research Programme-2022-23			
SL No	**Programme / Project (Duration)**	**Major Objective**	**Expected Output**	**Annual Budget Thousand Tk.**
	Program Area: Socio Economics and Policy			
1	**CV for estimating yield and yield contributing characters of BRRI varieties**	1. To determine the acceptable limit of CV for biometric characters of rice varieties 2. To determine the relative contribution of phenotypic characters/yield contributing characters to rice yield 3. To review the existing experimental data	1. To determine the acceptable limit of CV for biometric characters of rice varieties 2. To determine the relative contribution of phenotypic characters/yield contributing characters to rice yield 3. To review the existing experimental data	**3.00**
	Validation of statistical method for adoption percent of BRRI varieties	1. Selection of proper statistical method for estimating adoption percent of BRRI varieties.	1. Selection of proper statistical method for estimating adoption percent of BRRI varieties.	**3.00**
2	**Dynamics of Multi-trait stability index (MTSI) for identifying the most stable genotypes of three rice growing season in Bangladesh**	1. To evaluate the stability of rice genotypes by multi-trait stability index (MSTI) analysis under different environmental conditions. 2. To investigate the Dynamics of Multi-trait stability index (MTSI) for identifying stable genotypes	2. To evaluate the stability of rice genotypes by multi-trait stability index (MSTI) analysis under different environmental conditions. 3. To investigate the Dynamics of Multi-trait stability index (MTSI) for identifying stable genotypes	**3.00**

3	**Rice database and analysis system (RDAS)**	1. To develop a web based integrated framework on 'Rice Database and Analysis System (RDAS) 2. To create map and graph based on rice data.	1. To develop a web based integrated framework on 'Rice Database and Analysis System (RDAS) 2. To create map and graph based on rice data.	**3.00**
4	**Utilizing Medium-Range Weather Forecasts in Advisory Generation for Sustaining Rice Productivity in Bangladesh**	1. To understand the weather/climate induced risk in the local context. 2. To validate the information type (climate and advisory generated) and timescale needed at the local level. 3. To get an overview of how the advisory mechanism is currently working in the ground. Finding gaps/challenges and possible solutions. 4. To identify capacity building needs at local level	1. To understand the weather/climate induced risk in the local context. 2. To validate the information type (climate and advisory generated) and timescale needed at the local level. 3. To get an overview of how the advisory mechanism is currently working in the ground. Finding gaps/challenges and possible solutions. 4. To identify capacity building needs at local level	**5.00**
5	**Projected Climatic Factors (2050) Maps of Bangladesh** (In collaboration with Irrigation and Water Management Division, Plant Physiology Division and all R/S)	1. To construct projected climatic factors maps of Bangladesh for 2050 2. To determined projected climatic factors value district/division wise of Bangladesh for 2050. 3. To deliver an idea about future climate to researchers and planners	1. To construct projected climatic factors maps of Bangladesh for 2050 2. To determined projected climatic factors value district/division wise of Bangladesh for 2050. 3. To deliver an idea about future climate to researchers and planners	**3.00**

	Suitability Mapping of Various Cropping Pattern (In collaboration with RFS and IWM)	To construct suitability map of various cropping pattern	1. To construct suitability map of various cropping pattern.	**3.00**
	Groundwater zoning Map of Bangladesh (In collaboration with IWM and all R/S)	1. To construct groundwater zoning map of Bangladesh. 2. To find out favorable and critical zone of groundwater use area of Bangladesh	1. To construct groundwater zoning map of Bangladesh. 2. To find out favorable and critical zone of groundwater use area of Bangladesh	**3.00**
6	**Training program on multivariate data analysis**	1. To train up BRRI scientists on multivariate data analysis using different statistical software. 2. To give clear and straightforward guideline of how to conduct experimental design for MVA. 3. To make BRRI scientists self-dependent on multivariate data analysis. 4. To developed skills on research planning, program and report writing.	1. To train up BRRI scientists on multivariate data analysis using different statistical software. 2. To give clear and straightforward guideline of how to conduct experimental design for MVA. 3. To make BRRI scientists self-dependent on multivariate data analysis. 4. To developed skills on research planning, program and report writing.	**3.00**
7	**Develop a web application to calculate the Stability Index for BRRI Stability Model**	1. To develop a web application to calculate the stability index for BRRI stability model	1. To develop a web application to calculate the stability index for BRRI stability model.	**3.00**

	Develop a Platform for BBRI Developed Management Information System (MIS)	1. To develop a unique platform for BRRI developed MIS	1. To develop a unique platform for BRRI developed MIS	**3.00**
8	**Smart profiling of rice varieties in 0Bangladesh**	1. To explore mechanism for profiling rice varieties with respect to environmental suitability, physical and physiological characteristics, yield potential and tolerance to abiotic and biotic stresses; 2. To electronically present and disseminate the newly developed smart profiled varieties information through a dynamic web application and mobile app to stakeholders; 3. To manage, maintain and host mobile and web app at server.	1 To explore mechanism for profiling rice varieties with respect to environmental suitability, physical and physiological characteristics, yield potential and tolerance to abiotic and biotic stresses; 2 To electronically present and disseminate the newly developed smart profiled varieties information through a dynamic web application and mobile app to stakeholders; 3 To manage, maintain and host mobile and web app at server.	**38.00**
	New version of rice knowledge bank (RKB) mobile Apps	1. To develop the new version of RKB mobile apps. 2. To develop a push notification system. 3. To manage and maintain RKB Mobile apps	1. To develop the new version of RKB mobile apps. 2. To develop a push notification system. 3. To manage and maintain RKB Mobile apps	**11.20**
	Farm Management Division			
	Proposed Research Program 2022-23			

Sl. No	Program area/Project (Duration)	Major Objectives	Expected output	Annual budget (Thousand Tk.)
	Program Area: Socio Economics and Policy			
	3.1.Project : Rice production management			
	Expt. 1. Artificial Plough Pan Development for Facilitating Modern Farm Machineries	1. To increase soil resistance capacity 2. To develop artificial plough pan in BRRI farm	A method to develop plough pan in soil of BRRI for farm mechanization	1.00
	Expt. 2. **Determination of Fertilizer Management to Control Algae Infestation in Rice Field**	1. To determine fertilizers' effect on algal growth in rice field 2. To identify fertilizer management to control algae in rice field	A of fertilizer management method to control algae.	0.50
	Expt. 3. Suitable Chemical Control of Algae in Rice Field	To identify suitable algae control chemical for rice field.	A method to control algae at rice field.	0.50
	Expt. 4. Influence of different dates of transplanting on growth, yield performance and quality of fine rice varieties	To confirm best planting time of fine rice varieties for higher yield and quality.	Appropriate transplanting date and variety might be identified for growth, yield performance and quality.	0.50
	Expt. 5. Effect of storage time in different storage technologies on quality of rice	1. To observe the grain quality of fine rice variety at different storage time and storage technologies. 2. To identify the suitable storage technologies for preservation of rice seed.	Appropriate storage time and storage technologies might be identified for rice variety.	0.50
	Expt. 6. Effect of Nitrogen Levels on Protein Quality of Rice at Different Regions	To find out the best nitrogen level for protein quality of rice at different regions.	Appropriate nitrogen dose for growth, yield and protein quality of rice at different regions.	4.50
	Expt. 7. Efficacy of Mechanical Seedling	1) To evaluate the efficacy of newly developed mechanical rice transplanter cum fertilizer	Suitable fertilizer dose might be identified for	1.00

	Transplanter and Deep Placement of Mixed Fertilizer on Rice Yield	applicator. 2) To observe the yield and yield contributing parameters. 3) To analyze the cost of production.	mechanical rice transplanter cum fertilizer applicator.	
	Expt. 8. Effect of Foliar Application of Silicon on Yield of Aromatic Rice	1. To investigate the effect of foliar application of silicon's aqueous solution (sodium silicate) on yield of aromatic rice. 2. To observe the disease and insect infestation.	Appropriate Silicon solution might be identified for fine/premium quality rice variety.	1.00
	3.2. Project: Labor Management System			
	Expt. 1. Assessment of Health issues of laborers at BRRI farm	1. To examine the biological, psychological, and social health of labors in BRRI farm. 2. To determine the factors that might affect the health of labors at BRRI. 3. To suggest the policy recommendations for ensuring safety measures in terms of health hazards.	Labour health risk status might be identified.	0.50
	Expt. 2. Evaluation of Laborer's Efficiency according to Their Age at BRRI HQ, Gazipur	To identify age basis laborer's efficiency for better management of rice cultivation.	Labour information might be identified	**0.50**
	Expt. 3. Documentation of laborers' wage for efficient management and planning for rice Cultivation.	To find out the laborers' wage for rice cultivation throughout Bangladesh with food and without food.	The average wage rate throughout the year may be higher than previous years.	**1.00**
	3.3. Project: Rice Seed Production			
	Expt.1. Performance of BRRI Varieties in Seed Production Plots at BRRI Farm.	To observe potential yield of BRRI varieties.	Actual yield of a variety in farm.	2.50
	3.4. Project: Management and utilization of resources			

	Expt.1. Management and Utilization of Land, Agricultural Implements and Labor Resources.	To efficient utilization of farm land and labor resources for smoothly running of research activities and seed production at BRRI farm.	Better outcome from farm land and labor and smooth operations of farm implements.	13.0
	Expt. 2. Management and Support Services of BRRI.	Efficient utilization of resources for smoothly running of research activities and other activities of BRRI.	Smooth management and attractive office premises.	8.5
	Adaptive Research Division			
	Proposed Research Program: 2022-2023			
Sl. No	**Program area/Project**	**Major Objectives**	**Expected Output**	**Annual Budget (Thousand Tk.)**
Program Area: Technology Transfer				
01	**Adaptive Research**			
	Validation of Technologies	**Validate the matured technologies at farm level**		**Project Total**
	1. Varietal development			**12000-15000**
	Advanced Lines Adaptive Research Trial (ALART) during T. Aus 2022, T. Aman 2022 and Boro, 2023	To evaluate the yield potential and adaptability of advanced breeding lines at farmers' field in different agro-ecological zones of Bangladesh. To get feedback information about the advantages and disadvantages of the advanced lines from farmers and DAE personnel.	Some lines may be recommended for proposed variety trial (PVT) from which few lines will be released as variety in future.	
	1.1 ALART direct seeded conditions, deep areas (100- 150 cm water depth), Broadcast Aman 2022.	Do	Few lines suitable for deep water ecosystem may be recommended for PVT.	1000.00

	Locations: Faridpur, Gopalganj, Manikganj, Habiganj, Manikganj, Sirajganj, BRRI Gazipur			
	1.2 ALART Drought Tolerant Rice (DTR)T. Aman 2022 Locations: Chuadanga, Meherpur, Comilla, Rajshahi, Nagaon, Chapainawabganj, Rangpur, Rangpur, Bogura, Gazipur	Do	Few DTR lines may be recommended for PVT.	1000.00
	1.3 ALART Premium Quality Rice (PQR)T. Aman 2022. Locations: Chuadanga, Meherpur, Comilla, Rajshahi, Nagaon, Chapainawabganj, Rangpur, Rangpur, Bogura, Gazipur	Do	Few PQR lines may be recommended for PVT.	1000.00
	1.4 ALART SHR-1 (zirashail type) T. Aman 2022. Locations: Kustia, Kustia, Jessore, Rajshahi, Nagaon, Natore, Dinajpur, Dinajpur, Rangpur, Bogura, Gazipur	Do	Few zirashail type lines may be recommended for PVT.	1000.00
	1.5 ALART SHR-2 (Extra-long and long slender) T. Aman 2022. Locations: Kustia, Kustia, Jessore, Rajshahi, Nagaon, Natore, Dinajpur, Dinajpur, Rangpur,	Do	Few extra-long and long slender lines may be recommended for PVT.	1000.00

	Bogura, Gazipur			
	1.6 ALART for salt tolerant rice (STR), T. Aman 2022 Locations: Satkhira, Satkhira, Khulna, Feni, Noakhali, Bagerhat, Bagerhat, Barguna, Patuakhali, Gazipur	Do	Few STR lines may be recommended for PVT.	1000.00
	1.7 ALART for Blast Resistant Rice (BRR) (Re-ALART), Boro 2022-23 Locations: Faridpur, Barishal, Rajshahi, Rangpur, Bagura, Cumilla, Habiganj, Satkhira, Kishoreganj, Gazipur	Do	Few BRR lines may be recommended for PVT.	2300.00
	1.8 ALART for Short Duration Favorable Boro Rice (), Boro 2022-2023 Locations: Rangpur, Gopalganj, Faridpur, Barishal, Natore, Sirajganj, Cumilla, Feni, Kushtia, Habiganj, Manikganj, Gazipur	Do	Few FBR-SD lines may be recommended for PVT.	1000.00
	1.9 ALART for Medium Duration Boro Rice (FBR-MD), Boro 2022-2023 Locations: Rangpur, Gopalganj, Faridpur, Barishal, Natore, Sirajganj, Cumilla, Feni, Kushtia, Habiganj, Manikganj, Gazipur	Do	Few FBR-MD lines may be recommended for PVT.	1000.00

	1.10 ALART for Superior High Yielding Rice (SHR-1), Boro 2022-23 Locations: Bogura, Kushtia, Jessore, Rajshahi, Habiganj, Cumilla, Rangpur, BRRI Gazipur	Do	Few Superior High Yielding Rice lines may be recommended for PVT.	1000.00
	1.11 ALART for Superior High Yielding Rice (SHR-2), Boro 2022-23 Locations: Bogura, Kushtia, Jessore, Rajshahi, Habiganj, Cumilla, Rangpur, BRRI Gazipur	Do	Few Superior High Yielding Rice lines may be recommended for PVT.	1000.00
	1.12 ALART for Favorable Boro Rice (FBR-Barishal), (Re-ALART), Boro 2022-23 Locations: Rangpur, Gopalganj, Faridpur, Barishal, Natore, Sirajganj, Cumilla, Feni, Kushtia, Habiganj, Mymensingh, Gazipur	Do	Few FBR lines may be recommended for PVT.	1000.00
02	**Dissemination of Technologies**	**Conducting on-farm trials for dissemination of BRRI technologies**		**Project Total**
	2. Seed Production and Dissemination Program (SPDP)	To encourage the farmers for production, processing and storing of quality seed at on-farm level. To increase adoption of BRRI varieties. To get feedback information from the farmers and DAE personnel about BRRI varieties.		**9000-10000.00**

	2.1 SPDP in B. Aus 2022 under GoB	To disseminate BRRI dhan43, BRRI dhan83 varieties	About 4-ton seed will be produced from this program from which 0.5 tons will be retained for next year cultivation.	200.0
	2.2 SPDP, T. Aus 2022 under GOB	B To disseminate BRRI dhan82, 98 & BRRI hybrid dhan7	About 20-ton seed will be produced from this program from which 5 tons will be retained for next year cultivation.	800.0
	2.3 Dissemination Program of BRRI hybrid dhan7 during T. Aus 2022 under GOB	To disseminate BRRI technologies in the hilly region of Bangladesh.	About 25.0-ton seed will be produced from this program.	400.0
	2.4 SPDP in *Jhum* of Hilly areas in Aus 2022	To disseminate BRRI dhan55, BRRI dhan82 and 85 in hills	About 4.0-ton seed will be produced from this program from which .6 tons will be retained for next year cultivation.	100.0
	2.5 SPDP in Valley of Hilly areas in T. Aus 2022	To disseminate BRRI technologies in the hilly region of Bangladesh.	About 8.0-ton seed will be produced from this program from which 1.0 tons will be retained for next year cultivation.	150.0
	2.6 SPDP T. Aman 2022 under GoB	To disseminate BRRI varieties in different region of Bangladesh.	About 100.0-ton seed will be produced from this program from which 10.0 tons will be retained for next year cultivation.	1800.0
	2.7 SPDP in Valley of Hilly areas in T. Aman 2022	To disseminate BRRI technologies in the hilly region of Bangladesh.	About 8.0-ton seed will be produced from this program from which 2.0 tons will be retained for next year cultivation.	400.0

	2.8 Dissemination of BRRI dhan71 & 75 in the northern districts in T. Aman-Potato-Boro cropping pattern During Aman 2022	To disseminate BRRI dhan71 & 75 in the northern districts in T. Aman-Potato-Boro cropping pattern	About 4.0-ton seed will be produced from this program from which 1.0 tons will be retained for next year cultivation.	300.0
	2.9 A new model of SPDP in T. Aman 2022	To disseminate BRRI varieties and technologies in different region of Bangladesh.	About 2.0-ton seed will be produced from this program from which 1.0 tons will be retained for next year cultivation.	500.0
	2.10 SPDP T. Aman 2022 under TRB	To disseminate BRRI varieties and technologies in different region of Bangladesh.	About 26.0-ton seed will be produced from this program from which 5.0 tons will be retained for next year cultivation.	400.0
	2.11 HHAT Aman 2022 under TRB	To disseminate BRRI varieties through block demonstration in different region of Bangladesh.	Location specific suitable Aman varieties will be identified which will help rapid dissemination of modern varieties.	200.0
	2.12 SPDP in Boro 2022-23 under GoB	To disseminate BRRI varieties through block demonstration in different region of Bangladesh.	About 200-ton seed will be produced from this program from which 35 tons will be retained for next year cultivation.	2500.0
	2.13 SPDP with Polythene covered dry seedbed in Boro 2023	To disseminate with Polythene covered dry seedbed (SPDP-PCD) technology in the haors of Sylhet region	SPDP-PCD technology will help to reduce the growth duration upto 20 days in late transplanting areas which may be helpful to escape flash flood.	600.0
	2.14 SPDP Boro 2022-23 under TRB	To disseminate BRRI varieties and technologies in different	About 40-ton seed will be produced from this program from	350.00

		region of Bangladesh.	which 5 tons will be retained for next year cultivation.	
	2.15 Head to Head Adaptive Trial distribution among the collaborators, Boro 2022-23	To disseminate BRRI varieties and technologies at farmers' level.	Location specific suitable Boro varieties will be identified which will help rapid dissemination of modern varieties.	800.00
03	**Promotional activities**	To update knowledge and skill of farmers and stalk holders on modern rice cultivation technology.	Farmers will be more interested as well as adopt BRRI technologies.	**Project Total (Thousand tk.)**
	3. Training/Field Days			**5800.00-6200.00**
	3.1 Farmers' training in Aus 2022, T. Aman 2022& Boro2023 under GoB and TRB Total no: 120	To train the farmers on modern rice production technologies. To improve the farmers' knowledge and skill on rice production technologies. To create farmers' awareness about recent technologies.	About 3600 farmers and SAAOs will be trained up about modern rice production technologies.	3000.00
	3.2 Field Day in Aus 2022, T. Aman 2022 & Boro 2023 under GoB, TRB Total No. 100	To get feedback information directly from the farmers. For rapid dissemination of rice technologies among the farmers.	About 8000 farmers and extension personnel will gain knowledge about BRRI varieties which will help varietal dissemination throughout Bangladesh.	2800.00
04	**Enrichment of own seed stock**			
	4.1 Production of quality seeds of BRRI released recent varieties.	To produce quality seeds of BRRI varieties for adaptive research trials during Aman and Boro season.	About 7.0 tons of TLS seeds will be produced at BRRI farm which will be used in Seed Production and Dissemination	300.00

			Program (SPDP).	
	Training Division			
	Proposed Research Program 2022-23			
	Program Area: Technology Transfer			
Sl. No	**Program area/Project**	**Major Objectives**	**Expected Output**	**Annual Budget (Thousand Tk.)**
1	Training Need Assessment PL: Dr. Md. ShahadatHossain PI: Dr.ShahnazParveen	To assess the need and expectations of the participants from the training.		
2	Capacity Building and Technology Transfer Through Training PL: Dr. Md. ShahadatHossain PI: Dr.ShahnazParveen	• To enrich the knowledge of the participants on rice production technologies. • To disseminate BRRI developed technologies through extension personnel		
	2.1 Rice production and communication training course for BRRI scientists.(2-months) PL: Dr. Md.ShahadatHossain PI: Dr. ShahnazParveen PI: MA Momin	To acquire and enrich knowledge on: ▪ Modern rice production technologies ▪ Identification of field problems of rice cultivation and its solutions ▪ Research planning and execution. ▪ Data collection, analysis and interpretation ▪ Report/scientific article writing and presentation and ▪ Help extension personnel for quick dissemination of rice production technologies		15 Lac
	2.2 Training on modern rice production technologies (Yield	To train the extension agents so that they can: ▪ Able to use and disseminate modern rice production		25 Lac

	maximization).(one week) PL: Dr.Md.ShahadatHossain PI: Dr.ShahnazParveen PI: MA Momin	technologies and ▪ Identify and solve the field problems of rice cultivation and help the farmers to increase productivity.		
	2.3 Training course on project proposal writing(one week) PL: Dr.Md.ShahadatHossain PI: Dr.ShahnazParveen	Through this course the Participants will learn: ▪ Challenges/barriers of developing a proposal ▪ Steps of the different project proposals ▪ Methodology of developing a proposal ▪ Techniques of writing a proposal ▪ Documents need to be attached ▪ Proofing,revising and finalizing the document		4.50 Lac
	2.4 Advanced research data management and refresher training course on scientific report writing(one week) PL: Dr. Md.ShahadatHossain PI: Dr.ShahnazParveen	The Participants will have developed their skills in: ▪ Organizing scientific paper ▪ Preparing each part of the paper to communicate scientific information effectively		4.60 Lac
	2.5 Training on Rice Pest Management(3 days) PL: Dr. Md.ShahadatHossain PI: Dr.ShahnazParveen	• To increase knowledge of pest (insects, diseases and weed) management in rice ecosystem. • To identify the pest in the field and • To increase ability to solve pest problems in rice field.		4.50 Lac
	2.6Training on management	This course will enable participants to:		3.00 Lac

	technologies of rice and data collection procedure(one week) PL: Dr. Md.ShahadatHossain PI: Dr.ShahnazParveen	• Learn and recognize the principles and techniques of modern rice production • Identify and solve field problems of rice cultivation and • Collect data properly from the experimental plot.		
	2.7 Farmers Training on Modern Rice Production Technologies PL: Dr. Md.ShahadatHossain PI: Dr.ShahnazParveen	To trained the farmers so that they can • Apply the modern techniques of rice production • Identification of field problems of rice cultivation and its solution		2.50 Lac
	2.8Special Training on specific issues related to rice production	• Objectives depend on the respective training courses.		
3	Evaluation of imparted training program	• Evaluate the overall training program • Assess the trainees performances • Assess the resource speaker performances		
	Regional Station, Cumilla			
	Proposed Research Program 2022-2023			
Sl. No.	**Program area/ Project (Duration)**	**Major Objectives**	**Expected Output**	**Annual budget Thousand Tk.**
	Program Area (01): Varietal Development Program (VDP) **Program for T. Aman season 2022-23**			
1	**Project-1: Development of Transplanted Aman rice with high yield along with desirable growth duration, acceptable grain quality and resistance to diseases and insect pests, water stagnation tolerant and premium quality rice (BRRI R/S, Cumilla own program)**			1000 GOB
1.1.1	Hybridization	Introgression of genes from diverged genetic background into rice varieties/lines for the improvement of standard T. Aman varieties	To make crosses among the expected breeding lines	

1.1.2	Confirmation of F_1	To confirm the crosses as true hybrid	To confirm F_1 crosses	
1.1.3	Growing of F_2 population through FRGA	Advancement of segregating progenies	Advancement of segregating progenies	
1.1.4	FRGA nursery (F_3-F_6)	Advancement of segregating progenies	Advancement of segregating progenies	
1.1.5	Observational Yield Trial-Cum (OYT-Cum)	Initial yield evaluation of advanced lines compared to standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.1.6	Preliminary Yield Trial-Cum (PYT-Cum)	Preliminary yield evaluation of advanced lines compared to standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.1.7	Maintenance breeding	Conservation of advanced lines and pre-breeding materials	To maintain the advanced breeding lines for further use	
	Project-2: Development of Boro rice with high yield along with desirable growth duration, acceptable grain quality and resistance to diseases and insect pests and premium quality rice			
1.2.1	Hybridization	Introgression of genes from diverged genetic background into rice varieties/lines for the improvement of standard T. Aman varieties	To make crosses among the expected breeding lines	
1.2.2	Confirmation of F_1	To confirm the crosses as true hybrid	To confirm F_1 crosses	
1.2.3	Growing of F_2 population through FRGA	Advancement of segregating progenies	Advancement of segregating progenies	
1.2.4	FRGA nursery (F_3- F_6)	Advancement of segregating progenies	Advancement of segregating progenies	
1.2.5	Observational Yield Trial-Cum (OYT-Cum)	Initial yield evaluation of advanced lines compared to standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.2.6	Preliminary Yield Trial-Cum (PYT-Cum)	Preliminary yield evaluation of advanced lines compared to standard checks	High yielding with desirable growth duration new	

			breeding lines will be developed	
1.2.7	Secondary Yield Trial#1-Cum (SYT#1-Cum)	Confirmation of yield evaluation in a replicated trial and selection of desirable lines compared with standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.2.8	Secondary Yield Trial#2-Cum (SYT#2-Cum)	Confirmation of yield evaluation in a replicated trial and selection of desirable lines compared with standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.2.9	Adavanced Yield Trial#1-Cum (AYT#1-Cum)	Initial yield evaluation and selection of desirable lines compared to standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.2.10	Adavanced Yield Trial#1-Cum (AYT#2-Cum)	Initial yield evaluation and selection of desirable lines compared to standard checks	High yielding with desirable growth duration new breeding lines will be developed	
1.2.11	Maintenance breeding	Conservation of advanced lines and pre-breeding materials	To maintain the advanced breeding lines for further use	
2	**Program Area (02): Pest Management**			
2.1	Survey and monitoring of major rice diseases in Cumilla district	1. To know the prevalence of Major rice disease blast 2. To assume the rice yield losses due to rice diseases	Disease forecast model will be developed.	50 GOB
2.2	Demonstration of rice neck blast disease management technology under farmer's field condition	1. To minimize yield loss due to blast disease 2. To build up farmers awareness on blast disease management	Farmer awareness about Blast disease management technology will be increased.	50 GOB
2.3	Varietal reaction and recovering ability of BRRI released rice varieties	To know the varietal reaction against tungro disease of rice	Tungro recovering ability rice variety will be identified.	50 GOB
2.4	Validation of Rice Tungro disease management technology from seedbed in Cumilla	To validate the management technology of rice tungro disease in Cumilla region	Farmer awareness about Tungro disease management technology will be	700 GOB

	region		increased.	
2.5	Tracking the infection source(s) of rice false smut disease	To identify whether the seed/soil and/ or the air is/are the carrier of the pathogen or not	Mode of infection of false smut disease will be determined.	50 GOB
2.6	Evaluation of new chemicals against Blast disease of rice	To find out the effective chemicals suitable for Blast disease of rice.	New fungicides will be registered for controlling blast disease	50 GOB
2.7	Evaluation of new chemicals against Sheath blight disease of rice	To find out the effective chemicals suitable for ShB disease of rice.	New fungicides will be registered for controlling sheath blight disease	50 GOB
2.8	Multi-Location Trial (MLT) of blast resistant advanced lines	To evaluate specific and general adaptability of the advance breeding lines as compared with checks	Blast disease resistant rice variety will be released.	100 GOB
2.9	Evaluation of tungro resistant advanced lines in hot spot areas in Cumilla region	To evaluate the tungro resistant advanced lines in natural farmers field condition.	Tungro disease resistant rice variety will be released.	100 GOB
2.10	Advisory services to the farmers	1. To assist farmers for rice production;	Yield loss will be minimized.	50 GOB
3	**Program Area: Crop-Soil-Water Management**			
3.1	Effect of nursery management on the performance of rice variety grown under water stagnant condition. (New)	To find out optimum seed density To find out optimum age of rice seedling in waterlogged condition To identify proper seeding rate in water stagnant condition.	Stagnant tolerant rice will be developed.	60 GOB
3.2	Effect of seedling age and fertilizer management on growth and yield of rice variety.(New)	To find out optimum age of rice seedling to maximize yield. To optimize urea split application with varying seedling age	Appropriate seedling age and fertilizer package will be developed.	50 GOB
3.3	Effect of planting time on growth and yield of BRRI developed newly T. Aman and Boro varieties	To find out the appropriate time of planting for yield optimization	Appropriate planting time will be found out. .	50 GOB
3.4	Effect of K fertilization at different growth	To find out the effect of potassium fertilization at different growth stages of Rice	Suitable potassium fertilization time will be	50 GOB

	stages on growth and yield of rice		determined.	
3.5	Long-term missing element trials for diagnosing the limiting nutrient in soil in Cumilla	To determine nutrient deficiency problems in soil. To observe long-term yield trend of rice. To evaluate the changes in soil properties under long-term rice.	Limiting nutrient factor on rice yield in rainfed and irrigated ecosystem will be determined.	70 GOB
3.6	Effects of N rates on the yield of BRRI released news varieties in BRRI Cumilla	To update the N rates of BRRI released new varieties	Optimum N rate with maximum rice yield will be determined.	50 GOB
3.7	Effects of P rates on the yield of BRRI released new varieties in BRRI Cumilla	To update the P rates of BRRI released new varieties	Optimum P rate with maximum rice yield will be determined.	50 GOB
3.8	Effects of K rates on the yield of BRRI released new varieties in BRRI Cumilla	To update the N rates of BRRI released new varieties/ advanced lines in BRRI Farm Cumilla	Optimum K rate with maximum rice yield will be determined.	50 GOB
3.9	Determination of appropriate time of DAP application to control Algal growth	To find out the appropriate time of DAP application To control the algal growth in the rice field.	Algal control management will be determined.	50 GOB
3.10	Effect of DAP and urea rates on growth and yield of rice	To find out a suitable combination of DAP and Urea for desired rice yield	Suitable combination of DAP and Urea fertilizer will be determined.	50 GOB
4	**Program Area: Socio Economic and Policy**			
4.1	Stability analysis of BRRI released rice varieties	To demonstrate the suitability of BRRI varieties in Cumilla Region	Adaptation model of BRRI released rice varieties will be developed.	50 GOB/TRB
5	**Program Area: Technology Transfer**			
5.1	Field demonstration of different BRRI released new rice varieties in Cumilla region	To demonstrate and disseminate BRRI varieties in greater Cumilla region	New high yielding rice varieties will be disseminated quickly and directly to the farmers.	2000 GOB/TRB/ PPNB
5.2	Farmer's and SAAOs training on modern	To increase farmers/ SAAOs/ Officers knowledge	Farmers and Officer's	2000 GOB/TRB/

	rice cultivation and disease management technology (PPNB/GoB)		knowledge on modern rice cultivation and technologies will be enriched.	PPNB
5.3	Field day on modern rice cultivation (GoB & PPNB)	To increase farmers knowledge	Farmers knowledge on modern rice cultivation and technologies will be enriched.	500 GOB/TRB/ PPNB
	Regional Station, Habiganj			
	Proposed Research Program 2022-2023			
Sl. No.	**Program area/ project with duration**	**Major objectives**	**Expected Output**	**Annual budget (Thousand Tk)**
	1. Program area: Varietal Development			
	Project I: Improvement of B. Aman			
1	Regional Yield Trial	Intermediate tall deepwater rice genotypes suitable for shallow flooded deepwater areas will be selected.	2-3 superior lines will be identified	50.00
2	Advanced Yield Trial	On-farm verification of yield and other agronomic characters of advanced lines	1-2 superior lines will be identified	100.00
3	Advanced Yield Trial	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	100.00
	Project II: Improvement of aerobic rice			
1	Growing F_3 Population	F_4 population will be selected for developing high yield potential T Aus lines	F_4 lines suitable for T. Aus will be selected	100.00
2	Hybridization	Development of high yielding anti-oxidant enriched rice with aroma.	7-8 crosses will be done	100.00
	Project II: Improvement of Rainfed Lowland Rice			
1	Regional Yield Trial, SS &LS	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
2	Advanced Line Adaptive Research Trial (ALART), PQR	On-farm verification of yield and other agronomic characters of advanced lines	1-2 superior lines will be identified	50.00

	Project IV: Improvement of Irrigated Rice (Boro)			
1	Regional Yield Trial, FBR	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
2	Regional Yield Trial, CTR	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
3	Regional Yield Trial, ZER	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
4	Regional Yield Trial, DRR	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
5	Regional Yield Trial, Barisal	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
6	Regional Yield Trial, STR	On-station verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
7	Advanced Line Adaptive Research Trial (ALART), FBR-MD	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
8	Advanced Line Adaptive Research Trial (ALART), FBR-SD	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
9	Advanced Line Adaptive Research Trial (ALART), BRR_BLB	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
10	Advanced Line Adaptive Research Trial (ALART), BRR	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
11	Advanced Line Adaptive Research Trial (ALART), SHR-1	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
12	Advanced Line Adaptive Research Trial (ALART), SHR-2	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00
13	Advanced Line Adaptive Research Trial (ALART), FBR-Barisal	On-farm verification of yield and other agronomic characters of advanced lines	2-3 superior lines will be identified	50.00

	2. Program area: Crop-Soil-Water Management			
1	Determination of optimum N and K fertilizer dose for newly released rice varieties in Haor area	To determine the optimum N & K doses for newly released rice varieties in Haor area To increase rice yield	Optimum N & K doses for newly released rice varieties in Haor area will be determined	100.00
2	Effect of time of planting on growth, yield and yield contributing factors of BRRI released varieties in Boro season at Haor region of Bangladesh.	To identify the suitable time of planting and variety for Haor area. To recommend appropriate high yielding variety for Haor area.	Suitable time of planting and variety for Haor area will be determined	50.00
3	Long-term missing element trial for diagnosing the limiting nutrient in soil.	To identify the yield limiting nutrient if any in the soils of BRRI Habiganj farm.	The yield limiting nutrient if any in the soils of BRRI Habiganj farm will be identified	70.00
4	Effect of irrigation suspension on mitigating greenhouse gas emission in irrigated rice cultivation	To assess the GHG and net carbon balance To assess the water productivity (WP) To EF and GHGI	GHG and net carbon balance and water productivity will be determined	200.00
5	Effect of greenhouse gas emission under light texture soil with different fertilizer management in Rangpur	To find of greenhouse gas emission -To find out of global warming potential To find out net emission and fixation	Greenhouse gas emission rate, global warming potential and net emission and fixation will be identified	200.00
6	Global warming potential under Jute-T. Aman-Boro cropping system at Kushtia region	To identify the CH_4, CO_2 and N_2O emission To mitigate the global warming potential in rice soils under different fertilizer application To find out Net carbon balance	CH_4, CO_2 and N_2O emission rate determined and mitigation strategies for the global warming potential in rice soils under different fertilizer application will be determined	200.00

7	Net carbon balance and carbon footprint as influenced by organic amendment under Wheat-T. Aman cropping system	To identify the CH_4, CO_2 and N_2O emission To mitigate the global warming potential in rice soils To find out Net carbon balance To assess the carbon footprint To find out carbon input and output	CH_4, CO_2 and N_2O emission rate determined and mitigation strategies for the global warming potential in rice soils under different fertilizer application will be determined	200.00
8	Performance of grain yield & CH_4 emission of newly rice varieties at Sylhet regions	To find out CH_4 emission under newly Boro rice varieties.	CH_4 emission under newly Boro rice varieties will be determined	100.00
9	Growth, Development and Yield of Rice in Response to Cold Temperature	To examine the effects of low temperature at panicle development stages.	The effects of low temperature at panicle development stages will be investigated	100.00
	3. Program area: Pest Management			
1	Integrated Management of Bakanae disease of rice	To manage Bakanae disease of rice through integrated management options	Bakanae disease of rice through integrated management options will be identified	100.00
2	Monitoring the insect pest, natural enemy and their incidence using light trap	To study the pest and their natural enemy incidence patterns in rice fields and to create a database.	Pest and their natural enemy incidence patterns in rice fields will be determined	100.00
3	Survey of rice insect pests in Sylhet Region	To find the incidence pattern of major rice insect pests and natural enemies in Sylhet region.	Incidence pattern of major rice insect pests and natural enemies in Sylhet region will be investigated	100.00
	4. Program area: Socio-Economics and Policy			
1	Stability Analysis of BRRI released Boro	To observe the general and specific adaptability and stability of the	The general and specific	50.00

	Varieties	BRRI released rice varieties at BRRI Regional Station, Habiganj.	adaptability and stability of the BRRI released rice varieties at BRRI Regional Station, Habiganj will be investigated	
	5. Programme area: Technology Transfer			
1	Demonstration of newly released Aus, T.Aman and Boro varieties	To demonstrate the performance of newly BRRI released Aus, T. Aman and Boro rice varieties to the farmers field	The performance of newly BRRI released Aus, T. Aman and Boro rice varieties will be evaluated	200.00
2	Farmers' training and Field days for Aus, T. Aman and Boro	To deliver the knowledge about the modern rice cultivation techniques to the farmers	300-400 farmers are trained with modern rice cultivation techniques	300.00
3	Breeder seed production	To produce quality Breeder seeds at BRRI farm Habiganj	~ 25 tons of breeders of different varieties will be produced	1000.00
4	Truthful level seed production (TLS)	To produce locally popular TLS seeds and to ensure quality seeds to the local farmers	~ 20 tons of TLS seeds of newly released varieties will be produced	600.00
	Regional Station Rangpur			
	Proposed Research programme, 2022-2023			
Sl. No.	**Programme area/project (Duration)**	**Major Objective(s)**	**Expected output**	**Amount budget (Thousand Tk.)**
	Program Area: Varietal Development			
01.	**Development of Second Generation Rice (SGR)**	Development of high yielding (≥8 t/ha for T. Aman and ≥10 t/ha for Boro) rice varieties with improved modified plant type giving the thrust is to develop short duration varieties accompanied with tolerance to drought/cold, resistance to major biotic stresses (insect and diseases) and acceptable grain quality.		
1.1	Germplasm collection and Hybridization	To introgress genes from diverse genetic background	10 germplasm will be collected and 20 crosses will be made	20

1.2	F1 Confirmation	To confirm as true F1s'	10 crosses will be confirmed	10
1.3	Observational Yield Trial (OYT)	Selection of homogeneous breeding lines	150 genotypes will be evaluated	30
1.4	Preliminary Yield Trial (PYT)	Selection of best homogeneous breeding lines in replicated trail	20 genotypes will be evaluated	30
1.5	Maintenance and seed increase of parents/lines/land races	Maintain different germplasm for breeding purpose	Local and modern rice variety as germplasm will be maintained	20
2.0	**Breeding for standard rice varieties for Rangpur region**	Development of high yielding (>=06 t/ha for T. Aman and (>=08 for Boro season) rice varieties giving the thrust is to develop short duration varieties accompanied with tolerance to drought/cold, resistance to major biotic stresses (insect and diseases) and acceptable grain quality.		
2.1	Germplasm collection and Hybridization	To introgress genes from diverse genetic background	8 germplasm will be collected and 20 crosses will be made	20
2.2	F1 Confirmation	To confirm as true F1s'	15 crosses will be confirmed	10
2.3	Field RGA	To advance segregating generation	10 F2-F5 segregating generation will be advanced	30
2.4	Observational Yield Trial (OYT)	Selection of homogeneous breeding lines	50 genotypes will be evaluated	30
2.5	Preliminary Yield Trial (PYT)	Selection of best homogeneous breeding lines in replicated trail	15 genotypes will be evaluated	30
2.6	Maintenance and seed increase of parents/lines/land races	Maintain different germplasm for breeding purpose	Local and modern rice variety as germplasm will be maintained	20
3.0	**Development of Medium stagnation and submergence Tolerant Rice (MSSTR)**	To develop multiple stress tolerant rice varieties like stagnant flood and flash flood submergence with high yield potential (≥8 t/ha) under stress condition.		
3.1	Germplasm collection and Hybridization	Germplasm collection and Hybridization	5 germplasm will be collected and 20 crosses will be made	20
3.2	F1 Confirmation	To confirm as true F1s'	5 crosses will be confirmed	10

3.3	Maintenance and seed increase of parents/lines/land races	Maintain different germplasm for breeding purpose	Local and modern rice variety as germplasm will be maintained	20
4.0	**Breeding for Photoperiod-sensitive rice varieties (PSR) for lowland and Charland ecosystem**	Development of Photoperiod-sensitive high yielding climate smart rice varieties with yield potential (≥8 t/ha)		
4.1	Germplasm collection and Hybridization	To introgress photoperiod-sensitive responsible genes from diverse genetic background	5 germplasm will be collected and 10 crosses will be made	20
4.2	F1 Confirmation	To confirm as true F1s'	10 crosses will be confirmed	10
4.3	Maintenance and seed increase of parents/lines/land races	Maintain different germplasm for breeding purpose	Local and modern rice variety as germplasm will be maintained	20
5.0	**Breeding for Basmati type rice varieties**	Development of high yielding rice varieties with yield potential (≥6 t/ha)		50
5.1	Germplasm collection and Hybridization	To introgress genes from diverse genetic background	5 germplasm will be collected and 10 crosses will be made	20
5.2	F1 Confirmation	To confirm as true F1s'	10 crosses will be confirmed	10
5.3	Field RGA	To advance segregating generation	5 F2-F5 segregating generation will be advanced	30
5.4	Observational Yield Trial (OYT)	Selection of homogeneous breeding lines	100 genotypes will be evaluated	30
5.5	Preliminary Yield Trial (PYT)	Selection of best homogeneous breeding lines in replicated trail	20 genotypes will be evaluated	30
5.6	Maintenance and seed increase of parents/lines/land races	Maintain different germplasm for breeding purpose	Local and modern rice variety as germplasm will be maintained	20
6.0	**Breeding for Antioxidant Rice (Black/ Red/ Purple)**	To develop high yielding (≥6 t/ha for T. Aman and ≥8 t/ha for Boro) rice varieties with improved plant type and acceptable grain quality		
6.1	Germplasm collection and maintenance breeding	Collection of local, cultivated and exotic germplasm for the utilization of variety development	05 germplasm will be collected and 05 will be	**5**

			characterized	
6.2	Hybridization	Introgression of genes from diverse genetic background	10 parents will be used for 10 crosses	**10**
6.3	F1 Confirmation	Confirmation of F_1 as true hybrid	10 crosses will be grown	**5**
6.4	Observational Yield Trial (OYT)	Evaluation of promising breeding lines for their homogeneity, adaptability, phenotypic acceptability and high yield potentials	40 test entries along with three checks will be evaluated	**20**
6.5	Preliminary Yield Trial (PYT)	Preliminary yield evaluation of promising breeding lines for their homogeneity, adaptability, phenotypic acceptability and high yield potentials	05 test entries along with three checks will be evaluated	**20**
7.0	**Development of disease resistant hybrid rice parental lines by conventional way**			
7.1	Source Nursery	To make a test crosses for identification of prospective disease resistant maintainers and restorers from diverse genetic origin	Approx. 50 elite lines with target genes and 5 CMS lines will be used for crossing program	50
7.2	Test cross Nursery	i) Confirmation of maintainers and restorers from the crossed entries, ii) Selection of heterotic rice hybrids, iii) Conversion of prospective maintainers into new CMS lines	Approx. 120 testcrosses (F1s) along with their parents and three standard hybrid check variety will be evaluated	50
8.0	**Development of disease resistant hybrid rice parental lines by molecular way**			
8.1	Hybridization	Introgression of blast resistant genes into bacterial blight resistant restorer lines using MABC	Bacterial blight (BB) with Blast resistant parental lines will be developed	**50**
8.2	F_1 Confirmation	i) To confirm F_1s as true hybrid ii)To initiation of backcrossing	True F_1s will be confirmed with target resistant genes by MAS -Pi9	**50**
9.0	**Development of submergence tolerant hybrid rice**	1. Identification of prospective submergence tolerant maintainers and restorers from diverse genetic origin. 2. Selection of heterotic rice hybrids		

	parental lines	3. Conversion of prospective maintainers into new CMS lines		
9.1	Source Nursery	To make a test crosses for identification of prospective disease resistant maintainers and restorers from diverse genetic origin	Maximum number of crosses with diverse genetic origin will be initiated	20
9.2	Test cross Nursery	i) Confirmation of maintainers and restorers from the crossed entries, ii) Selection of heterotic rice hybrids, iii) Conversion of prospective maintainers into new CMS lines	Prospective maintainers, restorers and heterotic rice hybrids will be identified	20
	Program area: crop-soil-water management			
1.1	Yield maximization of BRRI dhan88, BRRI dhan89, BRRI dhan102 through adjustment at variable time of planting in Boro Season	To determine optimum planting time	Yield maximization will be possible	50
1.2	Evaluation of BRRI dhan87, BRRI dhan93 and BRRI dhan95 under different time of planting in rainfed lowland ecosystem	To assess the performance of selected rice varieties under double-transplanting method in rainfed lowland rice ecosystem	Yield maximization will be possible	50
	Regional Station, Sirajganj			
	Proposed Research Programme 2022-2023			
Sl. No.	**Programme area/Project (Duration)**	**Major objective**	**Expected output**	**Annual budget (Tk)**
1	Effects of soil amendment practices on grain yield and yield components of modern variety at BRRI farm, Sirajganj	To improved soil physical properties that will improve soil water retention capacity of the root zoon.	Soil amendment practice for Char land area will be achieved	50,000/-
2	Effect of Biochar on rice yield and soil health on problem soils.	To determine the effect of biochar on rice growth, yield and soil health of Char land area	Soil amendment practice for Char land area will be achieved	50,000/
3	Effect of transplanting date on the yield of newly developed	To find out the suitable transplanting date of newly developed rice variety in terms of	Optimum planting time for maximum yield will be find	50,000/

	inbred rice varieties	maximum benefit.	out	
4	Response of latest BRRI varieties and management practices in Char land areas of Sirajganj	To determine the suitability of newly released BRRI varieties in char land areas. To disseminate BRRI recommended management practices in char land areas.	BRRI recommended management practice in char land area will be disseminated for higher yield	50,000/
5	Effect of seedling number on yield performance of Bangabandhu dhan100 in char land area at variable planting	To determine optimum number of seedling for higher yield To find out the optimum planting time	Optimum seedling number and planting time will be find out	50,000/
6.	Determination of optimum nitrogen level for maximizing the yield of T. Aman - Mustard - Boro cropping pattern in Bogura region	To find out the optimum nitrogen doses under Boro-T. Aus-T. Aman cropping pattern	Optimum nitrogen dose for T. Aman - Mustard - Boro cropping pattern will be achieved	50,000/
7.	Determination of optimum dose of nitrogen on growth and yield of BRRI dhan87 in char land area	To determine the optimum dose of nitrogen on maximum yield of BRRI dhan87	Optimum nitrogen dose will be find out for BRRI dhan87 in char land area	25,000/
8.	Determination of optimum doses of Nitrogen on growth and yield of Bangabandhu dhan100 in char land area	To determine the optimum dose of nitrogen on growth and yield of Bangabandhu dhan100	Optimum nitrogen dose will be find out for BRRI dhan100 in char land area	25,000/
	Regional Station, Kushtia			
	Proposed Research Program 2022-2023			
Sl. no.	**Programme area/Project (Duration)**	**Major Objective**	**Expected Output**	**Annual budget (Thousand Tk.)**
	Season: T. Aus 2022			
1.	**Project 1 Variety Development**			

	1.1 Regional Yield Trial Favorable Condition (Including 8 entries against 2 standard checks)	Evaluation of agronomic performance, specific and general adaptability under on station condition	One or more advanced breeding lines will be found higher yielder than checks.	30
	1.2 ALART for Premium Quality Rice (PQR) (Including 2 entries against 2 standard checks)	To evaluate the yield potential and adaptability of the advanced lines at farmers' field in different agro-ecological zones.	One or more advanced breeding lines will be found higher yielder than checks.	**25**
	1.3 ALART for Super High yielding Rice (SHR-1 Zirashail type) (Including 5 entries against 2 standard checks)			**25**
	1.4 ALART for Super High yielding Rice (SHR-1 Extra-long & long slender) (Including 5 entries against 2 standard checks)			**25**
	1.5 ALART for Drought Tolerant Rice (DTR) (Including 2 entries against 2 standard checks)			**25**
	1.6 Regional Yield Trial Short Duration & Medium Duration (SD/MD) (Including 3 entries against 2 standard checks)		One or more advanced breeding lines will be found higher yielder than checks.	**30**
	1.7 Regional Yield Trial Zirashail Type (Including 3 entries against 1 local checks)			**30**
	1.8 Regional Yield Trial Disease Resistant Rice (DRR-BB) (Including 3 entries against 3 standard checks)			**30**

	1.9 Regional Yield Trial Rainfed Lowland Rice (RLR) (Including 4 entries against 4 standard checks)			**30**
	1.10 Regional Yield Trial Zinc Enriched Rice (ZER) (Including 4 entries against 2 standard checks)			**30**
	1.11 Regional Yield Trial Swarna & Long Slender Type (SLS) (Including 5 entries against 2 standard checks)			**30**
	1.12 Regional Yield Trial Short Slender Type (SS) (Including 3 entries against 1 standard checks)			**30**
	Season: Boro 2022-23			
	1.13 Title: Identification and screening of prospective aerobic rice from local and BRRI developed rice varieties, Boro, 2020-21 (Including 10 entries against 3 standard checks)	Evaluation of agronomic performance, specific and general adaptability under on station condition	One or more advanced breeding lines will be found higher yielder than checks.	**30**
	1.14 Regional Yield Trial Favorable Boro (FBR-Bio.) (Including 5 entries against 2 standard checks)			**30**
	1.15 Regional Yield Trial Water Saving Rice (WSR) (Including 2 entries against 1 standard checks)			**30**

	1.16 Regional Yield Trial Long Duration (FBR-LD) (Including 5 entries against 3 standard checks)			**30**
	1.17 Regional Yield Trial Short Duration (FBR-SD) (Including 9 entries against 2 standard checks)			**30**
	1.18 Regional Yield Trial Medium Duration (FBR-MD) (Including 9 entries against 2 standard checks)			**30**
	1.19 Regional Yield Trial Extra Long Slender (FBR-ELS) (Including 6 entries against 3 standard checks)			**30**
	1.20 Regional Yield Trial Salt Tolerant Rice (STR) (Including 7 entries against 3 standard checks)			**30**
	1.21 ALART for Favorable Boro Rice (FBR-Barishal) (Including 4 entries against 2 standard checks)	To evaluate the yield potential and adaptability of the advanced lines at farmers' field in different agro-ecological zones.	One or more advanced breeding lines will be found higher yielder than checks.	**1,75,000**
	1.22 ALART for Medium Duration Boro Rice (FBR-MD) (Including 2 entries against 2 standard checks)			
	1.23 ALART for Medium Duration Boro Rice			

	(FBR-SD) (Including 4 entries against 2 standard checks)			
	1.24 ALART for Super High yielding Rice (SHR-1) (Including 3 entries against 1 standard checks)			
	1.25 ALART for Super High yielding Rice (SHR-2) (Including 3 entries against 1 standard checks)			
	1.26 ALART for Blast Resistant Rice (BBR) (Including 4 entries against 2 standard checks)			
	1.27 ALART for Blast Resistant Rice (BBR) (Re-ALART) (Including 4 entries against 2 standard checks)		One or more advanced breeding lines will be found higher yielder than checks.	
	Project II: Rice Farming Systems			
2	**2.1** Yield response of rice to different rates of Nitrogen and Potash fertilizer in Boro-Fallow-T. Aman cropping pattern in Kushtia (continue).	i) To find out the best dose combination of Urea and MoP	Productivity as well as farmers' income will be increased.	**30**
	2.2 Increasing the system productivity of the dominant cropping pattern in Kushtia region (Boro-Fallow-T. Aman)	i) To increase the whole systems productivity through inclusion of modern varieties and advanced agronomic management practices ii) To increase farmer's income through adding high value oil seed crops (mustard) in the existing pattern		**30**

	2.3 Increasing System Productivity Through inclusion of Rabi crops in Boro-Fallow-T. Aman Cropping Pattern in Kushtia Region (New)	To increase system productivity and farmer's income through inclusion of vegetable in the existing cropping pattern.		**30**
	2.4 Performance of different cropping patterns for year-round vegetable production under agro-forestry systems with exotic date palm (*Phoenix dactylifera*).	i) To ensure year-round vegetable supply for farm family ii) To increase whole farm productivity		**30**
	2.5 Evaluation of different rice-based cropping patterns under agro-forestry systems with exotic date palm (*Phoenix dactylifera*).	i) To ensure food sufficiency for farm family ii) To increase whole farm productivity		**30**
3	**Project III: Socio Economic**			
	3.1 Stability analysis of BRRI varieties, T. Aus, 2022 (Including 13 varieties)	To maintain season, year and location-wise data base on the yield performance of BRRI varieties.		**15**
	3.2 Stability analysis of BRRI varieties, T. Aman, 2022 (Including 47 varieties)			**15**
	3.3 Stability analysis of BRRI varieties, Boro, 2022-23 (Including 49 varieties)			**15**
4	**Project IV: Crop-Soil-Water Management**			
	4.1	i) To measure minimum rice		**30**

	Determining minimum irrigation water requirement of rice in different regions through water balance from on-farm demand and model simulation	irrigation water requirement for different regions ii)To measure rice yield response to on-farm demand based and simulated irrigation application iii)To figure out the variation in irrigation water requirement quantification among the treatments		
	4.2 Determination of optimum time of planting and seedling age for yield maximization of BRRI dhan87 at Kushtia region	To find out optimum time of planting and seedling age for BRRI dhan87		**30**
5	**Project V: Technology Transfer**			
	5.1 Demonstrations of newly released BRRI varieties	To disseminate and popularize the varieties among the farmers in Kushtia	Farmers can choice new varieties.	**6,00,000**
	Regional Station, Bhanga, Faridpur			
	Proposed Research Program 2022-2023			
SL. No.	**Program area/Project (Duration)**	**Major Objective**	**Expected output**	**Annual budget '000 Tk.**
	Program Area: Varietal development, Farming Systems Research, Crop-soil-water management, Socio economics, Technology transfer			
1.	Breeding for developing high yielding Transplanting Aman rice varieties (Hybridization)	To develop breeding population with desirable characters with emphasis on water stagnation tolerance, anaerobic tillering, earliness and good grain quality.	Breeding population with desirable characters e.g water stagnation tolerance, anaerobic tillering, earliness and good grain quality will be developed	100
2.	Breeding for developing high yielding shallow flooded Deep water rice varieties	To develop breeding population with desirable characters of deep water Aman rice	Breeding population with desirable characters of deep water Aman rice	150

	(Hybridization)		will be developed	
3.	Breeding for developing Anoxia tolerant rice varieties	To develop high yielding anoxia and water stagnation tolerant rice genotypes for direct seeding condition to fit Onion/wheat- Jute-Relay T. Aman pattern	High yielding anoxia and water stagnation tolerant rice genotypes will be developed	75
4.	Confirmation of F_1s	To confirm the crosses as true hybrid	The crosses as true hybrid will be confirmed	50
5.	FRGA	Generation Advance	Generation will be advanced	50
6.	Collection of local rice landraces	To collect local rice landraces for breeding purpose and conserve in the Genebank of BRRI	Local rice landraces for breeding purpose will be collected	50
7.	Characterization of local rice landraces from Faridpur region	To maintain seed and characterize rice landraces as per 'Germplasm Descriptors and Evaluation Form' of GRSD, BRRI.	Seed and characterize rice landraces will be maintained	50
8.	Screening and identification of anaerobic germination (AG) tolerance rice germplasm of Bangladesh.	To identify donor for anaerobic germination tolerance	Donor for anaerobic germination tolerance will be identified	100
9.	RYT: DWR	To evaluate specific and general adaptability of the genotypes at BRRI R/S Bhanga, Faridpur	DWR genotypes will be developed for Faridpur region	100
10.	Head to Head Trial: VRS (Variety Replacement Strategy)	1. To evaluate the adaptation of BRRI released Rice varieties in different region of the country. 2. To compare the modern rice variety with local variety. 3. To select appropriate variety for specific region. 4. To disseminate the modern varieties throughout the country.	Adaptation of BRRI released Rice varieties in different region of the country will be selected for specific region	TRB Funded
11.	Demonstration trial of BRRI developed HYVs and Hybrids varieties	To disseminate the modern HYVs and Hybrids varieties in Faridpur region	Modern HYVs and Hybrids varieties in Faridpur region will be disseminated	200
12.	Effects of planting	1. To achieve sustainable rice	Planting time for	100

	time on yield of rice in char land area of Faridpur region	production at char land environment. 2. To adjust planting time for saving/protect *Aus* crop from early flood.	saving/protect *Aus* crop from early flood will be adjusted	
13.	Development of weed control techniques in Boro-Fallow-Fallow cropping pattern	To develop cost effective and eco-friendly weed control practices for sustainable weed management in Boro-Fallow-Fallow cropping systems.	Cost effective and eco-friendly weed control practices in Boro-Fallow-Fallow cropping systems will be developed	100
14.	Introduction of intercropping system in different cropping pattern for medium high land area in Faridpur region (On-going)	To increase cropping intensity and productivity in Faridpur region	Cropping intensity and productivity in Faridpur region will be developed	200
15.	Rice farming components could be an option for biological weed control at transplanted *Boro* rice field in Faridpur region	1. To reduce the weed infestation along with cost of labour 2. To find out the effective way for controlling the aquatic weed in irrigated wetland rice field 3. To increase the productivity and reduce the cost of production of rice in Faridpur region.	Productivity and reduce the cost of production of rice in Faridpur region will be increased	200
16.	Mulching technique of zero tillage garlic production in Garlic-Jute-Fallow cropping pattern at Faridpur region	1. To reduce the weed infestation along with requirement of irrigation 2. To increase the yield of garlic at Faridpur region	Weed infestation along with requirement of irrigation will be reduced	150
17.	A survey on crops and cropping of char areas in Faridpur region	1. To delineate socio economic profiles of the farmers, their land utilization pattern, existing cropping patterns, crops and crop production practices. 2. To know about soil properties and organic matter content	Socio economic profiles of the farmers, their land utilization pattern, existing cropping patterns, crops and crop production practices will be delineated	150
	Regional Station, Gopalganj			
	Proposed Research Programme 2022-23			

SI. No.	Programme area/ Project	Major Objective	Expected output	Annual Budget Thousand Tk.
1.	Collection of local rice landraces	To collect local rice landraces for breeding purpose and conserve in the Genebank of BRRI	Collected germplasm will safely be conserved and documented along with their characters	80.00
2.	Characterization of local rice landraces from Gopalganj region	To maintain seed and characterize rice landraces as per 'Germplasm Descriptors and Evaluation Form' of GRSD, BRRI.	Characterized rice landraces will be maintained and documented	50.00
3.	Preliminary yield trial of deep-water rice germplasm	To evaluate the yield performance of five deep water rice germplasm for comparing with standard check	The specific and general adaptability of the deep water rice germplasm as compared with standard checks was evaluated in on-station condition at Gopalganj Farm	30.00
4.	Secondary yield trial of Jhum rice genotypes	To evaluate the yield performance of two *Jhum* rice genotypes for comparing with standard check	The specific and general adaptability of the *Jhum* rice genotypes as compared with standard checks in on-station condition at Gopalganj Farm	25.00
5.	Regional Yield Trial (RYT)	Evaluation of agronomic performance, specific and general adaptability under on station condition	The regional yield trial was conducted to select the best performing advanced breeding lines with higher grain yield over the existing HYVs across multiple	120.00

			experimental sites.	
6.	Advanced Line Adaptive Research Trial (ALART)	To evaluate the yield potential and adaptability of the advanced rice genotypes at farmers' field in different agro-ecological zones	Evaluated best entry for proposed variety trial	200.00
7.	Collection and chemical analysis of peat soil	To analysis the soil nutrients To evaluate rapid peat sampling methods	Peat soil nutrients will be characterized	100.00
8.	Breeder seed production	To produce breeder seed of BRRI developed rice varieties	Increase quality seed production and distribution among farmers and BADC	140.00
9.	Hybrid seed production (BRRI hybrid dhan5)	To produce F1 seed of BRRI hybrid dhan5	Increase F_1 seed production and distribution among farmers	120.00
10.	Truthfully Label Seed (TLS) Production	To produce TLS seed of BRRI developed rice varieties as per indent of local demand	Increase quality seed production and distribution among farmers	80.00
11.	Head to Head Trial: VRS (Variety Replacement Strategy)	1. To evaluate the adaptation of BRRI released Rice varieties in different region of the country. 2. To compare the modern rice variety with local variety. 3. To select appropriate variety for specific region. 4. To disseminate the modern varieties throughout the country.	Adaptation of BRRI released Rice varieties in different region of the country will be selected for specific region	TRB funded
12.	Demonstration of newly released T. Aus , T. Aman and Boro varieties	To disseminate and popularize the newly released rice varieties in the Gopalgang, Narail and Bagerhat District	Modern HYVs and Hybrids varieties in Faridpur and Khulna region will be disseminated	800.00
13.	Intensification of Boro-Fallow-Fallow cropping pattern through of floating vegetable in deep water ecosystem of Gopalganj	i.To identify the suitable BRRI varieties of low land area of Gopalganj ii. To increase the cropping intensity	Productivity and reduce the cost of production of rice in Faridpur region (Gopalganj) will be increased	60.00
14.	Collection and chemical analysis of	i. To analysis the soil nutrients ii.To evaluate rapid peat sampling		100.00

	peat soil	methods		
	Regional Station, Sagardi, Barisal			
	Proposed Research Program 2022-23			
Sl. No.	**Program area/Project with duration**	**Major Objectives**	**Expected output**	**Annual Budget Thousand Tk.**
	Program area: varietal development			
1	Development of tidal submergence tolerance rice (On going)	To develop high yielding rice varieties adaptive to tidal ecosystem	HYV with tidal submergence (T. Aman) rice will be developed.	300
2	Characterization and Genotyping (SNP) of local landraces adapted to tidal submergence ecosystem (On going)	To find out the suitable genotypes for developing parental materials with tidal submergence potential	Suitable genotypes as parental materials with tidal submergence will be identified	800
3	Development of Photosensitive Varieties having submergence tolerant gene for non-saline tidal ecosystem of Barishal region (New)	To develop tall photosensitive rice variety for tidal ecosystem	Tall photosensitive HYV for tidal ecosystem will be developed	250
4	Advance Line Adaptive Research Trial (ALART) of submergence tolerance long duration rice (SubTR-LD) (New)	To select suitable advanced rice line adaptive to tidal submergence ecosystem	Suitable advanced line adaptive to tidal submergence will be further advanced for varietal development.	400
	Program area: pest management			
1	Pest monitoring in BRRI Barishal farm (On going)	To know the existing and new pest species.	New pest species of Barishal region will be identified.	100
2	Insect pests and natural enemy incidence in light trap (On going)	To quantify the population of insects and natural enemies.	Insects and natural enemy population of Barishal region will be quantified.	100
3	Survey of rice insect pests in Barishal region (On going)	To find the incidence patterns of major insects and natural enemies.	Incidence patterns of major insects and natural enemies of	200

			Barishal region will be delineated.	
4	Sweeping performance of Rectangular Hand Net in Seedbed (New)	To find out the insect pest attacking time and proper sweeping time in seedbed	Insect infestation and proper sweeping time in seedbed will be determined	100
5	Evaluation of biopesticides for management of Leaf folder and stem borer in field condition (New)	To find out efficacy of formulated biopesticides to control leaf folder and stem borer	Efficacy of formulated biopesticides to control leaf folder and stem borer will be determined	300
6	Bioaccumulation and detoxification of As (III) and disease management by *Achromobacter xylosoxidans* and increase rice yield in As-contaminated soil	To decrease As uptake and increase rice yield by spraying *A. xylosoxidans.*	Rice yield will be increased in As-contaminated soil by reducing As-contamination	400
7	Effect of plant extract mediated silver nano particle on bakanae diaese management (New)	To determine the effect of nano particle on bakanae disease management	Bakanae diaese of rice will be controlled by nano-technology	500
	Program area: crop-soil-water management			
1	Standardization of nitrogen application method for modern rice variety under tidal ecosystem (New)	To find out the suitable method of N-application in tidal condition	Proper N application method for rice in tidal condition will be determined.	100
2	Determination of nitrogen requirement for modern rice variety in tidal ecosystem (New)	To find out the optimum nitrogen dose for modern variety of rice in tidal ecosystem	Increased nitrogen use efficiency and economic N rate of HYV rice will be achieved.	100
3	Contribution of tidal water irrigation on the nutrition and yield of modern rice (new)	To determine the variation in the effect of tidal and ground water irrigation on the response of modern rice to nutrient application	Contribution of tidal water to the nutrition and yield of modern rice will be determined.	100
4	Exploring sediment deposition from tidal	To find out the silt deposition rate and	Quality of tidal water sediment	100

	water in Barishal regional station (On going)	to quantify organic and inorganic nutritients in deposited silt.	with respect to rice nutrition will be determined.	
	Program area: technology transfer			
1	Establishment of Techno-Village in Barishal Region (New).	To test feasibility of the considered technologies in Barishal region	BRRI developed technologies for modern rice cultivation will be evaluated in field level.	200
2	Field demonstration, Farmers' training, Field day	Dissemination of BRRI developed technologies.	BRRI's technologies will be disseminated. Farmers will be trained up with BRRI developed modern rice production technologies.	3000
	Regional Station, Satkhira			
	Proposed Research Program 2022-23			
Sl. No.	**Program area/Project with duration**	**Major Objectives**	**Expected output**	**Annual Budget Thousand Tk.**
	New Program			
1	Hybridization	To develop breeding lines with high yield potential along with desirable growth duration, acceptable grain quality and resistance to insect pests and salt tolerance	Insect and salt tolerance rice variety	200.0
2	Effects of bio-organic fertilizer on rice yield in Boro season in the south-western costal ecosystem	1. To evaluate the impact of bio-organic fertilizer on rice yield. 2. To determine the effect of bio-organic fertilizer on saline soil properties	Yield improvement	100.0
3	Introducing B. Aus rice in the Watermelon-Fallow-T. Aman pattern	To find out the scope of utilizing fallow land after watermelon cultivation by cultivating B. Aus rice under rainfed condition	Increase of cropping intensity	200.0
	On-going Program			
	Program Area: Varietal Development			
4	Regional Yield Trial	To evaluate specific and general	Variety release	200.0

	(RYT)	adaptability of the advance breeding lines with respective check-in on-station condition		
5	Multi-location Trial of blast resistance breeding lines (MLT-Blast)	To know the resistance of the lines against rice blast disease	Identification of blast resistance line	KGF
6	Confined Field Trial (CFT) for High Zinc and Iron (CFT-HIZR)	To evaluate phenotypic characteristics and agronomic performance under field conditions of advanced breeding lines containing high iron and zinc rice events (IRS1030-031, IRS1030-039 and IRS1027-059)	Development of high zinc and iron enriched rice	Project
7	Advanced Line Adaptive Research Trial (ALART)	1. To evaluate the yield potential and adaptability of the advanced rice genotypes at farmers' field 2. To get feedback information about the advantages and disadvantages of the selected materials from farmers and Extension personnel 3. To select suitable material(s) for Proposed Variety Trial (PVT)	Variety release as per objectives	200.0
	Program Area: Crop-soil-water management			
8	Effects of fertilizer and varietal management on greenhouse gas emissions in the South-Western costal ecosystem	To quantify green house gas emission in the rice field under saline ecosystem.	Estimation of green house gas emission in rice field	Project
	Program Area: Socio-economic policy			
9	Stability Analysis of BRRI Varieties at Satkhira	To find out the suitability and adaptability of the particular variety	Identification of stable rice variety in this region.	200.0
10	Rice Area Production Mapping (RAPM)	Mapping of rice cultivation area according to season	Estimation rice cover area	150.0
11	Estimation of rice yield in different seasons of Bangladesh: Crop cuts method	1. To find out the on-farm yield of BRRI released rice varieties in Satkhira and Jashore regions 2. To analyse the performance of BRRI released rice varieties with other varieties	Estimation of rice yield scenario.	150.0

	Program Area: Technology transfer			
12	Cost-effective hybrid rice production by optimizing seedling age and number	1. To find out the appropriate seedling age and number for transplanting of hybrid rice for optimum yield 2. Adjustment of seed rate for hybrid rice production from seed germination	Standardization of seedling age for low seedling mortality.	200.0
13	Raising Boro seedling for energy-efficient land use	1. Identification of healthy seedling raising technique of rice during cool temperature 2. Reduction of field duration of Boro rice cultivation by early transplanting	Understanding rice seedling raising protocol during cold period.	100.0
14	Assessment of specific and general adaptability for selection of suitable hybrid rice genotypes under saline prone areas for Boro season	To find out hybrid rice genotypes suitable for saline prone areas for Boro Season	Selection of saline tolerant hybrid rice line.	Project
15	Head-to-head adaptive trial (HHAT) of Modern Rice Varieties	1. To find out the adaptability of BRRI released rice varieties in various regions of Bangladesh 2. To compare modern rice varieties with popular local varieties 3. Selection of rice variety/varieties suitable for a particular region 4. To analyse farmers' response to modern rice varieties and take necessary actions accordingly	Selection of adaptable high yielding varieties among the elite varieties.	TRB Project
16	Seed production and dissemination program (SPDP)	To disseminate BRRI varieties rapidly among the farmers of Khulna and Satkhira region	Quality seed supply to the farmers.	200.0
	Program Area: Rice farming systems			
17	Development of four-cropped cropping pattern under irrigated ecosystem	1. To increase the total productivity of unit area per year by increasing cropping intensity 2. To compare the sustainability of four cropped cropping patterns in terms of soil health and economic profit.	Increase of total production under rice-based cropping pattern in a year.	100.0
	Program Area: Transforming rice breeding			
18	Line Stage Trial (LST)	To assess FRGA/RGA derived advanced breeding lines for	Identification of promising rice	TRB and IRRI

		uniformity at heading and desirable agronomic and grain type traits	lines.	Project
19	Observational Yield Trial (OYT)	Identification of genetically fixed advanced lines suitable for saline areas		
20	Preliminary Yield Trial (PYT)	Initial evaluation of breeding lines for yield and other agronomic characteristics in replicated trial		
21	Advanced Yield Trial (AYT)	Confirmatory evaluation of selected genotypes for yield and other agronomic characteristics		
22	Regional Yield Trial (RYT)	To evaluate specific and general adaptability of the advance breeding lines with respective check-in on-station condition		
23	International Rice Soil Stress Tolerant Nursery (IRSSTN)			
24	Asian Food and Agriculture Cooperation Initiative (AFACI) program	Initial evaluation of yield, salt tolerance and other agronomic characteristics of selected materials in replicated trial.		
25	AGGRi Network trial	To select the superior breeding lines in salinity stress environment of Bangladesh		
	Regional Station, Sonagazi, Feni			
	Research Activities during 2022-2023			
Sl. No.	**Programme area/ Project (Duration)**	**Major Objective**	**Expected output**	**Annual budget Thousand Tk**
		Season: Aus 2022		
1	Stability Analysis of BRRI developed rice varieties in Aus 2022	➢ To investigate the stability of BRRI developed Aus rice varieties ➢ To find out location specific suitable variety(s)	Stability data of the BRRI developed Aus rice varieties in coastal region of Bangladesh	
2	RYT-1 Favorable condition	➢ To evaluate specific and general adaptability of the advance breeding lines as compared with standard checks in on-station.	To get suitable line for ALART	

3	RYT-2 Non saline tidal condition	”	To get suitable line for ALART	
4	PVT Tidal Submergence	➢ To evaluate specific and general adaptability of the proposed variety as compared with standard checks farmer’s field.	To recommend for new variety	
5	Seed Production and Dissemination Program (SPDP) during Aus 2022 under GOB	➢ Rapid dissemination of newly released rice varieties to the farmers ➢ Motivate farmers to produce and preserve good quality seeds ➢ Increase availability of quality seed of modern rice varieties at farm level ➢ Exchange seeds from farmers to farmers ➢ Collect feedback about the varieties from farmers and Extension personnel.	Rapid dissemination of newly released rice varieties	
6	Mechanization BD48 & 98	➢ To show the effectiveness of farm mechanization to the farmers	Enhance farmers interest on mechanization	
7	Breeder Seed Production of BD48, 98	➢ To guarantee that the subsequent generation seed class (foundation seed) shall conform to the prescribed standards of genetic purity	To supply breeder seed	
8	TLS Production	➢ Utilize quality seed for conducting Research (HHAT) and Demonstration (SPDP) ➢ Provide seeds to different stakeholders to enhance dissemination of modern rice varieties.	To supply TLS	
9	Demonstration of BRRI hybrid dhan7	➢ Rapid dissemination of to the farmers ➢ To increase food security producing more rice.	Dissemination of BRRI hybrid dhan7	
		Season: Aman 2022		
10	Crossing of BR49, 52, 87, 94 & 103 with Rajashail and Kajalshail	➢ To develop new lines or variety	Development of new advance line suitable for costal region of Bangladesh	
11	Time of Planting (SD)	➢ To find out best possible transplanting time for short	Best possible transplanting time	

		duration varieties in southern region of Bangladesh	for short duration varieties in southern region of Bangladesh will be identified	
12	Time of Planting (LD)	➢ To find out best possible transplanting time for long duration varieties in southern region of Bangladesh	Best possible transplanting time for long duration varieties in southern region of Bangladesh will be identified	
13	Yield maximization	➢ To maximize the yield of rice through integrated use of manures and fertilizers	To get suitable fertilizer dose for maximum yield	
14	Stability Analysis of BRRI Varieties	➢ To investigate the stability of BRRI developed Aman rice varieties ➢ To find out location specific suitable variety(s)	Stability data of the BRRI developed Aus rice varieties in coastal region of Bangladesh	
15	Chemical Control of False Smut	➢ To find out best chemical to control false smut	Best chemical for false smut control will be identified	
16	Evaluation of Tungro resistant lines	➢ To evaluate tungro resistant advance lines in southern region of Bangladesh	Best performing Tungro resistant advance lines will be identified	
17	Multilocation trial of Promising Hybrid entries	➢ To evaluate newly developed hybrid entries in southern region of Bangladesh	Newly developed promising hybrid entries will be identified	
18	Multilocation trial of Promising Hybrid entries	➢ To evaluate newly developed hybrid entries in southern region of Bangladesh	Newly developed promising hybrid entries will be identified	
19	AGGRi Net Trial (ANT)	➢ To evaluate salinity resistant advance lines in the coastal region of Bangladesh	Highly saline resistant advance lines will be identified	
20	QTL analysis of Saline tolerant lines AGGRi-NET	➢ To collect phenotypic data of the advance lines in farmers field	Phenotypic data of the advance lines will be obtained	
21	PVT (Sallow Deep Water)	➢ To evaluate specific and general adaptability of the proposed	To recommend for new variety	

		variety as compared with standard checks farmer's field.		
22	RYT RLR	➢ To evaluate specific and general adaptability of the advance salinity tolerant breeding lines as compared with standard checks in on-station.	To get suitable line for ALART	
23	RYT ZER	”	To get suitable line for ALART	
24	RYT (Short slender)	”	To get suitable line for ALART	
25	RYT (Swarna and long slender type)	”	To get suitable line for ALART	
26	RYT (Dev. of disease resistant rice)	”	To get suitable line for ALART	
27	RYT (Tidal non-saline/Stagnant water)	”	To get suitable line for ALART	
28	RYT STR-1	”	To get suitable line for ALART	
30	RYT STR-2	”	To get suitable line for ALART	
31	RYT STR-1	”	To get suitable line for ALART	
32	RYT STR-2	”	To get suitable line for ALART	
33	ALART (STR)	➢ To evaluate the yield potential and adaptability of the rice genotypes at farmers' field as submergence tolerance short duration during T. Aman season. ➢ To get feedback information about the advantages and disadvantages of the selected materials from farmers and Extension personnel. ➢ To select suitable material(s) for proposed variety trial (PVT).	To recommend advance lines for PVT	
34	ALART (STR)	”	”	
35	ALART (PQR)	”	”	
36	Re-ALART (Submergence tolerant rice SubTR-LD)	”	”	
37	Re-ALART (Submergence tolerant	”	”	

	rice SubTR-LD)			
38	Cost effective weed management	➢ To find out cost effective weed management strategy in farmers field	cost effective weed management strategy will be identified	
39	Survey and monitoring of rice diseases in Aman 2022	➢ To monitor the disease prevalence at Chattogram and Rangamati region.	Disease prevalence data of Chattogram and Rangamati region will be obtained	
40	Breeder Seed Production	➢ To guarantee that the subsequent generation seed class (foundation seed) shall conform to the prescribed standards of genetic purity	To supply breeder seed	
41	TLS Production	➢ Utilize quality seed for conducting Research (HHAT) and Demonstration (SPDP) ➢ Provide seeds to different stakeholders to enhance dissemination of modern rice varieties.	To supply TLS	
42	Seed Production and Dissemination Program (SPDP) during Aman 2022 under GOB	➢ Rapid dissemination of newly released rice varieties to the farmers ➢ Motivate farmers to produce and preserve good quality seeds ➢ Increase availability of quality seed of modern rice varieties at farm level ➢ Exchange seeds from farmers to farmers ➢ Collect feedback about the varieties from farmers and Extension personnel.	Rapid dissemination of newly released rice varieties	
43	Seed Production and Dissemination Program (SPDP) during Aman 2022 under TRB	,,	,,	
44	Seed Production and Dissemination Program (SPDP) during Aman 2022 under HHAT	,,	,,	

45	Farmers Training on Rice Technologies 2022-23	➢ To update knowledge and skills of farmers and extension personnel on modern rice production technologies. ➢ To enhance dissemination of new technologies among the farmers.	Farmers knowledge on modern rice production technologies will be increased thus yield will be increased	
46	Field Day 2022-23	➢ Awareness building and create interest among the farmers and concerned extension agents about the modern rice production technologies.	Farmers awareness and interest among the varieties will be increased	
	Regional Station, Rajshahi			
	Proposed Research Program 2022-23			
SL	**Program area/Project duration**	**Major objective**	**Expected output**	**Annual budget (TK)**
	Program Area: Varietal development			
	Aus & Aman 2022-23			
1	Hybridization	To develop high yielding genotypes with drought tolerance at reproductive stage and slender grain quality	Growth duration: 120-130 days & Yield: 6.0-6.5 t/ha	15.0 lac
2	Confirmation of F1	High yield, drought tolerant & acceptable grain type	364 F_1 seeds of 7 crosses	
3	FRGA	Generation Advance	21834 progenies	
4	Collection and maintenance of local landraces	To characterize the local genotypes for Rajshahi region and to maintain the local germplasm for using in crossing program.	18 genotypes	
5	Yield Trial	To evaluate specific and general adaptability of the advance breeding lines as compared with standard checks in on-farm condition	Select good adaptable breeding lines with higher compared to standard checks.	
		Boro 2022-23		
1	Hybridization	To develop high yielding multi-trait (CT, DRR(Blast) & ZT grain) population.	Growth duration: 145-150 days & Yield: 6.5-7.5 t/ha	20.0 lac
2	Confirmation of F1	To confirm the crosses as true hybrid	20 F1 s will be grown	
3	FRGA	Generation Advance	15000 progenies	

4	Collection and maintenance of local landraces	To characterize the local genotypes for Rajshahi region and to maintain the local germplasm for using in crossing program.	50 genotypes	
5	Yield Trial	To evaluate specific and general adaptability of the advance breeding lines as compared with standard checks in on-farm condition	Select good adaptable breeding lines with higher compared to standard checks.	
		Pest management		
1	Evaluation of chemical against Sheath Blight disease , T. Aman 2022	To find out new fungicide(s) against sheath blight disease	To find out new fungicide(s)	0.5 lac
2	Efficacy of New Chemicals in Controlling Grain Spot, Brown Spot and Narrow Brown Spot of BRRI dhan28	To select appropriate chemical(s) against diseases To reduce minor diseases	To find out new fungicide(s)	
3	Integrated Approaches in reducing Sheath blight diseases	To minimize chemical use To increase yield	To minimize chemical use	
4	Effect of different fungicides against neck blast disease	To select appropriate chemical(s)	To select appropriate chemical(s)	
5	Survey and monitoring of different rice diseases	To investigate the present status of different type of rice diseases	To know the present status of rice diseases	
6	Effect of the height of solar light trap to maximize the catch of rice insect pest	To optimize the trap setting height for the highest rice pest catch.	The optimum trap setting height will be determined	
7	Impact of lighting period on the trapping of insects	To find out an effective lighting period for maximum insect trapping To find out suitable insect catching time.	The optimum trap setting period will be determined	
8	Stem borer species abundance and assessing yield losses in rice	To study the relative abundance of different species of rice stem borers and to determine the yield loss due to their damage.	Yield loss due to stem borer damage will be determined.	
		Program Area: Rice Farming System		
1	Evaluation of crop productivity under	To identify the profitable cropping patterns in Rajshahi region.	Crop productivity will be increased	1 lac

	four crops cropping patterns in farmer's field			
2	Evaluation of crop productivity and soil health under conservation tillage system in maize-mungbean-rice cropping pattern	To identify the profitable cropping patterns in Rajshahi region.	Crop and soil productivity will be increased	0.5 lac
3	Evaluation of crop productivity and soil health under conservation tillage system in maize-mungbean-rice cropping pattern	TO increase profitability and productivity	Crop productivity will be increased	1.5 lac
4	Effect of time of planting with seedling age on Boro rice varieties in Rajshahi Region	To determine optimum plating time of Boro rice in Rajshahi Region	Appropriate time of planting of Boro rice could be found	0.5 lac
5	Evaluation of zero tillage Mustard based cropping patterns in Barind region	To identify the extent of resource conservation and to increase the crop productivity.	Cost of production could be reduced	0.5 lac
6	Farmers participatory evaluation of relay system or zero tillage lentil-based cropping patterns	To identify the extent of resource saving and to increase the crop productivity.	Cost of production could be reduced	0.5 lac
7	Development of Mustard-Boro-Transplanted Jute-T. Aman four crops-based cropping patterns instead of Mustard-Boro-Cropping pattern	To increase productivity and cropping intensity	Crop productivity will be increased	0.6 lac