Proposed Research Program 2024-2025

Sl. No.	Program Area/Project/ Experiment Title & Duration	Major Objective	Expected output	Annual Budget (Thousand Tk.)
	Programme Area: Farm Mechanization and Postharvest Technology			
	Farm Machinery and Postharvest Technology Division & Workshop Machinery and Maintenance Division			
	1.0 Development of Agricultural Machines			
	1.1: Evaluating and modifying of BRRI developed machines	• To verify the quality of BRRI machines • To identify the functional problems of farm machines • To improve the performance of farm machines	Ensure to develop an Ideal prototype of modern farm machinery	50.00
	1.2: Design and development of walking type power operated rice transplanter	• To design and develop a power-operated rice transplanter • To test the performance of the developed rice transplanter	Prototype of a power operated walking type rice transplanter will be available for Bangladesh conditions.	2500.00
	1.3: Postharvest loss assessment of whole and head feed combine harvester under different soil conditions	• To assess the loss of grain. • To identify a suitable operating system to minimize the loss.	Technical faults of whole and head feed combine harvester will be identified.	50.00
	1.4: Performance evaluation of laser land leveler with the conventional method	• To evaluate the performance of laser land leveler and conventional systems • To find the feasibility of the laser land leveler in Bangladesh	Technical know-how of laser land leveler will be known.	1000.00

	1.5: Identification and fabrication of fast-moving spare parts of combine harvester and rice transplanter enhancing sustainable mechanization in Bangladesh	• To list down the fast-moving spare parts of the different make and model • To identify the strength and quality of the major parts • To take initiative for the fabrication of the parts	Fast-moving spare parts of combine harvester and rice transplanter will be identified.	1000.00
	1.6: Ground pressure and bearing capacity of combine harvester in different soil conditions	• To estimate ground pressure and bearing capacity of combine harvester in different soil conditions • To estimate the required force in cutting, threshing, cleaning, and bagging rice through combine harvester	The different soil parameter ie. ground pressure, Cone penetration resistance, Bulk density of soil etc. may help to design and fabricate ideal prototype of combine harvester in Bangladesh condition.	200.00
	1.7: Design and development of self-propelled fertilizer deep placement applicator	• To design, fabricate and develop a power-operated fertilizer deep placement applicator using the existing developed manual applicator. • To compare with other fertilizer applicators.	Power-operated fertilizer applicator will be developed and manually fertilizer deep placement difficulties will be solved.	300.00
	1.8: Modification of power transmission system of BRRI hydro-tiller	• To detect the causes of frequent tearing of hydro tiller chain • To modify the power transmission system for increasing the longevity of hydro tiller	Longevity of hydro tiller will be increased.	50.00
	1.9: Design and development of single-row wetland power weeder	• 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	Power-operated single row paddy weeder, as well as a multi-crop weeder, will be developed	100.00

		different multi-crop fields. • To compare with other dry and wetland paddy weeders		
	1.10: Design and development of a self-propelled multi-rows power weeder for both wet and dry land condition	• 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	Self-propelled multi-rows power weeder for both wet and dry land condition will be developed	500.00
	1.11: Performance evaluation of BRRI whole feed combine harvester (model no- BRRI WCH 2021) under different soil conditions, crop conditions, and seasons	• To evaluate the performance of BRRI combine harvester in respect of soil condition, crop condition, and seasons • To establish a relationship between the machine performance and plough pan depth of the field • To compare the performance of BRRI combine harvester with the traditional harvesting systems.	BRRI developed whole feed combine harvester would be able to meet the domestic demand and reduce import dependence.	250.00
	1.12: Improvement of a BRRI Head Feed Combine Harvester for mechanized rice cultivation (BRRI HCH2023)	• To design a head feed combine harvester • To manufacture the designed combine harvester prototype • To evaluate the field performance of the developed combine harvester	Ensure suitable combine harvester aimed at solving farmers' problem of harvesting in Bangladesh.	2000.00
	1.13: Performance evaluation BRRI auto seed sower machine for raising mat-type seedlings	• To assess the operational performance of the BRRI Auto Seed Sower Machine • To compare the performance with	This technology is viewed as a time-saving solution for efficiently preparing seedling trays for mechanical transplanting and potentially reducing	150.00

		imported Power Seed Sower Machine raising seedling for mechanical rice transplanter	reliance on manual labor.	
	1.14: Performance evaluation of BRRI Head Feed Combine Harvester (Model-BRRI HCH2023)	• To assess the field performance of the developed head feed combine harvester • To compare the performance with imported combine Harvester	BRRI developed head feed combine harvester would be able to meet the domestic demand and reduce import dependence.	150.00
	1.15: Improvement of a BRRI whole feed Combine Harvester (Model BRRI WCH2021)	• To identify areas for improvement in the BRRI Whole Feed Combine Harvester (Model BRRI WCH2021) • To design and fabricate of BRRI whole feed combine harvester based on the performance, repair, and maintenance facility • To evaluate the performance test of the developed combine harvester • To compare the performance with imported combine Harvester	Ensure suitable combine harvester aimed at solving farmers' problem of harvesting in Bangladesh.	25000.00
	1.16: Design, Development, and Fabrication of a BRRI ride-on rice transplanter for mechanical rice planting	• To design and develop of BRRI ride-on Rice transplanter • To evaluate the performance test of the developed Rice transplanter • To progress mechanized rice transplanting direct seedlings including direct and precision rice seedling technologies	Ride-on rice transplanter will enhance efficiency and effectiveness in rice cultivation and reduce human drudgery.	300.00
	1.17: Design and Development of BRRI Auto Seed Sower Machine for raising mat-type seedlings	• To design a BRRI auto seed sower machine to enhance precision and efficiency in raising seedlings in a tray.	Prototype of a Power-Operated Automatic Seed Sower Machine for mat-type seedling for raising mat-type seedlings will be available for	200.00

		• To develop a systematic and step-by-step manufacturing process utilizing locally available materials. • To evaluate the operational performance of the seed sower machine, assessing its effectiveness in seed sowing.	Bangladesh condition.	
	1.18: Performance Evaluation of the Yanmar Intelligent (Model: 6114R) Combine Harvester	• To evaluate the performance efficiency of the combine harvester. • To assess the yield monitoring, and yield loss in real time.	Technical know-how of the Yanmar Intelligent (Model: 6114R) combine harvester will be known.	500.00
	1.19: Design and Development of Paddy Collector	• To design and develop of Paddy collector • To evaluate the performance of the fabricated collector • Compare the collector with the manual method • Disseminate the Paddy collector	A paddy collector will be developed and efficiency of labour increased.	500.00
	2.0 Milling and Processing Technology			
	2.1: Test, evaluation, and modification of rubber roll de-husker for commercial use	• 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.	300.00
	2.2: Design and development of solar seed dryer	• To design, fabricate, and develop a solar dryer • To compare with traditional sun drying of paddy	A suitable solar seed dryer will be developed.	100.00
	2.3: Design and development of a compact rice mill	• To design and fabricate a compact rice mill • To evaluate the performance of	A mobile compact rice mill for consumer level will be developed.	1000.00

		fabricated rice mill		
	2.4: Design and development of a mini rice mill for homestead level using	• To design and develop a mini rice mill suitable for individual household • To evaluate the milling performance using different rice verities under different conditions • To analyze the cost of milling and the pay-back period.	A mini rice mill for homestead level using will be available.	500.00
	2.5: Design, development, and fabrication of recirculating type smart dryer for drying paddy	• To design and develop a recirculating-type smart dryer tailored specifically for paddy drying applications. • To implement advanced sensing and control technologies to create a smart drying system. • To conduct comprehensive testing and validation of the smart dryer prototype to evaluate its performance. • To assess the economic feasibility and potential scalability of the smart dryer technology for adoption in small to medium-scale rice processing facilities.	Appropriate drying process and tempering period will be identified for premium quality rice	1000.00
	2.6: Design and Development of a Two-Stage Rice Mill	• To design and fabricate a two-stage rice mill • To evaluate the performance of fabricated rice mill • Compare the performance with the engelberg huller	Two-stage rubber roll rice mill for house hold level will be available.	3000.00
	2.7: Design and development of a recirculating type mobile dryer.	• To evaluate the performance of the existing recirculating dryers • To design and fabricate a recirculating	A recirculating type mobile dryer will be developed for farm holder	750.00

		type mobile dryer for farm holders • To evaluate the performance of the developed dryer		
	3.0 Development of stores and storage technology			
	3.1: Effect of ageing on milling performance of premium quality rice	• To observe the milling performance of BRRI dhan50 at different aging	Data will be generated on head rice recovery and cooking parameters.	200.00
	4.0 Renewable Energy Technology			
	4.1: Study on solar energy utilization for small agricultural machinery	• To design a mechanism for solar energy utilization • To evaluate the performance of the developed machine	Small farm machinery (Paddle thresher, open drum thresher, winnower etc.) could be operate.	300.00
	4.2: Improvement and validation of solar energy utilization system for small types of different agricultural machinery	• To improve solar energy utilization system • To improve solar panel carrier • To evaluate the performance of the developed machine using solar energy	Small farm machinery (Paddle thresher, open drum thresher, winnower etc.) could be operate in the field	700.00
	4.3: Design and develop a solar-powered smart bird repellent	• To design an audio player using Arduino software • To identify the scary melodies for granivorous birds • To test the performance	User-friendly, smart bird repellent will be available that will enhance food security.	250.00
	4.4: Design and development of solar power-operated sprayer	• To design and fabricate a solar-power-operated sprayer • To evaluate the performance of the sprayer	Drudgery less smart sprayer will be developed	300.00
	4.5: Design and Development of Automated Rodent Trap for Reducing Post-Harvest Losses	• Design and development of an automated rodent trap • Performance evaluation of the	Eco friendly mouse trap will be developed and postharvest loss will be reduced	300.00

	of Rice	fabricated trap		
	5.0 Popularization of BRRI developed farm machinery and Postharvest technology			
	5.1: Industrial and farm-level extension of BRRI machinery and Postharvest technology	• To create awareness and demonstrate the benefit of using BRRI machines among farmers • To motivate the local entrepreneurs to manufacture BRRI-developed machinery	Awareness will be developed to use modern farm machinery	10.00
	5.2: Training on operation, repair, and maintenance of farm machinery	• To impart knowledge to the farmers/operators/mechanics/extension workers/entrepreneurs about the effective use of farm machinery • To develop skilled operators and mechanics	Skilled machine operator and mechanic for agricultural machinery operation and maintenance will be developed	3000.00
	6.0 Precision Agriculture			
	6.1: Detection of Pests Affected Areas in Rice Farming Using Remote Sensing and Machine Learning Techniques	• To enhance natural pest control measures for precision rice farming • To limit the environmental hazards • To validate the results with ground truth data	The rice pests affected damaged areas will be detected before creating a hazardous situation in rice farming.	250.00
	6.2: Assessing the future rainfall and temperature extremes from CMIP6 GCMs and their potential risk to rice cultivation in Bangladesh	• Assessing future changes in rainfall and temperature extremes based on data from the CMIP6 global climate models (GCMs). • Evaluating the potential risks associated with these changes to rice cultivation in Bangladesh.	The future rainfall and temperature extremes can be predicted which my help to avoid potential risk for rice cultivation in Bangladesh	350.00
	6.3: Developing a high-	• Compile high-quality historical	High-resolution gridded dataset (1km)	500.00

	resolution daily gridded precipitation and temperature data set for Bangladesh during 1961–2020	rainfall and temperature data. • Preprocess and clean data. • Assess covariates' influence on rainfall patterns. • Develop models using cross-validation. • Homogenize data series. • Interpolate gridded daily data. • Validate and evaluate dataset accuracy. • Adjust the dataset for reliability.	for Bangladesh and accessibility to stakeholders will be known.	
	6.4: Assessing Potential Rice Exposure to Heat Stress in Bangladesh under Different SSPs	• Assess the potential exposure of rice to heat stress in Bangladesh under various Shared Socioeconomic Pathways (SSPs). • Provide valuable insights for agricultural and climate adaptation policies.	Assessment of spatiotemporal changes in rice phenology and identification of hot spots in Bangladesh to heat stress will be known.	500.00