Proposed Research Program 2024-2025

Sl. No.	Program Area/Project/ Experiment Title & Duration	Major Objective	Expected output	
	Soil Science Division			
I.	**Fertility Assessment of Rice Soils and Nutrient use efficiency in rice**			
	1.1 Determination of nutrients (N and K) requirement of rice plant in field condition and prepare a strong image database	• To identify and estimate judicial N and K fertilizer requirement of rice plant in field condition by image-based analyses using android mobile set • To determine the effect of precision nutrient management on grain yield and socio-economic impact on new technology	Nutrient requirements of rice crop to be prescribed at field conditions by analyzing leaf colour images of a particular genotype	90
	1.2 Delineating productivity of rice soils in the ecologically constrained areas of Bangladesh through digital soil mapping (DSM)	• To determine the yield potentiality of rice soils in the ecologically constraint areas of Bangladesh through development of DSM • To generate recommendations for effective soil fertility management in the constraint areas	Detailed maps to be developed for precise nutrient recommendations and improved management of the identified fertility constraints.	Funded by PARTNER proj.
	1.3 Long-term effect of primary nutrients on crop growth, yield and soil properties under Conservation Agriculture	To evaluate the effect of primary nutrients on crop growth, yield and soil properties under conservation Agriculture	Development of tools for sustainable nutrient management for rice under conservation agriculture	Funded by PARTNER proj.
	1.4 Site specific nutrient management (SSNM) for ALART materials	To quantify nutrients at optimal rates and times in order to achieve high rice yield and high nutrient efficiency	Optimum nutrient recommendations for advanced breeding lines will be developed.	Funded by PARTNER proj

	1.5 Site specific nutrient management (SSNM) for newly released BRRI Varieties	To quantify nutrients at optimal rates and times in order to achieve high rice yield and high nutrient efficiency	Optimum nutrient recommendations for new rice varieties will be developed.	Funded by PARTNER proj
	1.6 Improve rice yield and nitrogen use efficiency through nano-technology and zeolite amendment (Lab & field expt.)	• To synthesis and characterized Urea-Nano fertilizer • To assess the N fertilizer use efficiency, yield contributing parameters, rice yield and soil available N	Development of synthesized nano-urea fertilizer to increase nitrogen use efficiency and rice yield.	Funded by PARTNER proj
	1.7 Potassium management in rice-based cropping pattern in Old Himalayan Piedmont soil	• To identify the K deficiency in soil and plant tissue in AEZ 1 (Piedmont soil) • To determine the K contribution for different crops (rice, wheat, maize etc.) • To increase crop yield in the respective cropping pattern and • To maintain soil fertility especially for K	Sustainable and improved rice yield and maintenance of soil K fertility.	Funded by LSTD proj
	1.8 Evaluation of the efficacy of commercial fertilizers and PGRs on rice cultivation (nano fertilizer, liquid fertilizer, combined fertilizer, sea weed extract and organic fertilizer)	To evaluate the efficacy of commercial fertilizers and PGRs for rice growth and yield.	The tested commercial fertilizers and PGRs will be recommended for improved rice yield.	Funded by PARTNER proj.
	1.9. Soil fertility map development and soil characterization of the research farms of BRRI Regional stations	• To develop a soil fertility map • 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 quantify the changes in soil	Detailed maps to be developed for precise nutrient recommendations in BRRI R/S.	2.0

		nutrients on long term basis		
	1.10. Carbon and nitrogen fractions and stocks under continuous wetland condition in intensive rice cropping	• To study the long-term effect of different inorganic fertilizer application on different fractions of SOC and soil N • To estimate the effect of long-term chemical fertilizer on changes in C & N in intensive rice cropping	Carbon and nitrogen stock in soil under continuous rice crop will be quantified	1.0
	1.11. Study the phosphorus fractions from Long-term phosphorus experiment	• To find out the different P fractions in long-term P application • To identify the mining nutrient • To determine the N-P, N-K, P-K, P-Zn ratio in soil • To maintain soil fertility	Net P balance in long-term rice production will be quantified.	1.5
	1.12. Changes of soil fertility of long-term missing element trial	• For maximizing rice yield • To identify the mining nutrient • For maintain soil fertility	Yield limiting fertility factors will be identified for better soil management	1.5
II.	**Integrated nutrient management for intensive rice cropping**			
	2.1. Best management practices to increase rice productivity and soil health	• To obtain quality and safe rice • To sustain crop yield • To maintain soil health & minimize environmental pollution	Development of technologies for safe rice production, maintenance of soil health and minimize environmental pollution	Funded by PARTNER proj.
	2.2 Nutrient management for fine, aromatic and premium quality rice of Bangladesh	• To observe the reduction of grain yield and quality of fine aromatic rice cultivars in north-western part of Bangladesh • To develop an integrated nutrient management package for increase rice	Integrated nutrient management package will be developed for increase the quality and yield of fine rice	Funded by LSTD proj

		yield and sustain soil fertility • To maintain grain qualities (aroma, fineness etc.) through proper fertilizations		
III.	**Soil and Environmental problem**			
	3.1. Greenhouse gas absorption, emission and mitigation under Wheat-Jute-T Aman cropping system in High Ganges river floodplain (AEZ-11)	• To assess the total absorption and emission of GHG • To find out net ecosystem carbon budget	Net ecosystem carbon budget in rice based production system will be quantified.	2.0
	3.2 Mitigating carbon emissions and measuring carbon absorption in rice cultivation through Zeolite application	• To generate data on GHG (CH_4 and N_2O) emissions from rice cultivation using various fertilizer management; • To find out a net carbon balance between emission and absorption from rice cultivation; • To develop technology that allows lower GHG emissions from rice cultivation, and creating awareness among farmers on GHG mitigation, and absorption	• GHG emissions will be quantified from rice fields with different fertilizer management, particularly Zeolite application and their upscaling in different agroecological zones. • Quantification of reduced global warming potential and higher rice yield. • Net carbon balance will be quantified	Funded by PARTNER proj.
	3.3. Saline Soil Management through organic & inorganic amendment & surface drainage	• To investigate the effectiveness of organic & inorganic amendments along with shallow surface drain in mitigating soil salinity & increasing rice yield	Strategies to mitigate soil salinity and increase rice yield in saline soils will be developed.	1.5
	3.4 Method validation for quantification of total and inorganic arsenic in husked	• To demonstrate the performance characteristics of ICPOES-HG quantification method for selective	Method validation and get accreditation by BAB for determining As.	Funded by PARTNER proj.

	and unhusked rice by ICP-OES with Hydride Generation	determination of inorganic (iAs) and total (tAs) As in husked and unhusked rice with a low detection limit. • To meet up the prerequisite to get accreditation by BAB of BRRI RAL for As.		
IV	**Soil Microbiology and Biofertilizer**			
	4.1. Innovative climate smart techniques for the improvement of hill soil health, conserve soil micro-biodiversity and Paddy yield in existing rice cultivation system	• To study the agricultural soil health (physical, chemical and biological properties of hill soil ecosystem) of Ramu, Sitakundu and Matiranga upazilla • To find appropriate climate smart need based nutrient management technologies for sustainable soil health and biodiversity of the hilly areas • To improve rice yield in ecofriendly practice	Development of appropriate climate smart nutrient management technologies for sustainable soil health of the hilly areas	80
	4.2. Isolation and screening of Methane Degrading Bacteria	• Isolation and identification of indigenous potential methanotrophs from paddy field • Determination of methane oxidation capability of the isolates.	Potential methanotrophs will be isolated from paddy field for reducing methane emission.	3.0