

Proposed Research Program 2024-2025

Sl. No.	Program Area/Project/ Experiment Title & Duration	Major Objective	Expected output	
	Irrigation and Water Management Division			
1.	Improvement of Water Use Efficiency in Irrigated Agriculture			
1.1	Determination of Physical and Hydraulic Properties of Different Soil Types (2022 to be continued)	<ul style="list-style-type: none"> • To determine important physical properties (bulk density, particle density, infiltration rate, hydraulic conductivity, soil-water retention, etc.) of root zone soil • To develop soil-water retention/characteristics curves • To determine parameters of soil-water retention function 	<ul style="list-style-type: none"> • Documentation of important soil physical properties for improved water management • Generation of data bank for utilization in crop modeling 	100
1.2	Development of an Automated and IoT based precision irrigation system using multiple sensors and automatic control gates. (2024-2028)	<ul style="list-style-type: none"> • To develop a sensor and IoT-based smart irrigation system for controlling water application in a plot as well as in the whole command area • To improve the water use efficiency and water productivity in rice cultivation • To develop a user-friendly irrigation saving technologies for the farmers 	<ul style="list-style-type: none"> • An automated and user-friendly water saving technology for rice • Increased water use efficiency and water productivity 	300
1.3	Study on Water-Stress Tolerance for Different Advanced Rice Genotypes of BRRI (2025 to be continued)	<ul style="list-style-type: none"> • To quantify water-stress tolerance capacity for different rice varieties • To determine yield of the rice varieties under different water-stress conditions 	<ul style="list-style-type: none"> • Scaling of water-stress tolerance capacity (WSTC) of each variety • Easy scheduling of irrigation based on WSTC • Additional information for cultivation 	100

			of a newly released variety	
1.4	Performance Evaluation of the Proposed Rice genotypes Under Different Water Regimes (2019 to continued)	<ul style="list-style-type: none"> To study performance of the proposed rice varieties under different water regimes To evaluate suitable water regimes for proposed lines/varieties of rice 	<ul style="list-style-type: none"> Determination of water stress tolerance capacity of proposed lines/variety Water management package identification for specific variety 	200
1.5	Optimization of Water Use Efficiency Through Subirrigation in Bangladesh (2022 to 2026)	<ul style="list-style-type: none"> To increase water use efficiency in crop cultivation To design and installation of subirrigation system To evaluate the performance of subirrigation system in transplanted rice field 	<ul style="list-style-type: none"> Feasibility of subirrigation system in rice cultivation Increased water use efficiency and water productivity 	300
1.6	Soil moisture sensor and IoT based automated sprinkler irrigation system for Rice (2024-2028)	To develop and implement a sensor and IoT-based smart sprinkler irrigation system to improve water use efficiency and productivity in rice cultivation	<ul style="list-style-type: none"> An automated and user-friendly water saving technology for rice Increased water use efficiency and water productivity 	300
1.7	Establishment methods and irrigation effects on crop performance and water productivity of Boro rice (2024-2026)	<ul style="list-style-type: none"> to evaluate the effect of establishment methods on rice growth, yield and yield components under different irrigation regimes; to determine the suitable establishment method and water use efficiency for rice cultivation 	<ul style="list-style-type: none"> Suitable rice establishment method and water use efficiency 	100
1.8	Real-time Monitoring System for Salt Dynamics in Different Textured Soils by Using Internet-of-Things (IoT) (2023-2025)	<ul style="list-style-type: none"> To develop a IoT based procedure for monitoring salt dynamics in soils, and To monitor salt movements during salinization and desalinization processes in 3 different textured soils 	<ul style="list-style-type: none"> A real time soil salinization and desalinization monitoring system will be developed based on IoT. These features will provide an integrated solution that can facilitate 	200

		under saturated/unsaturated conditions	the monitoring and prevention of soil salinization in coastal regions	
1.9	Performance Evaluation of Smart Card Operated Irrigation Management of Rice Field in Muhuri Project Areas of Feni District (2023-2026)	<ul style="list-style-type: none"> To optimize the use of water for irrigation applying smart card technique To reduce energy cost compared to farmer's traditional management practices To evaluate a cost-benefit analysis of the different irrigation methods 	To increase average water use, reduce water required /Kg of Boro rice production, increase yield avg. yield, reduce irrigation Cost, increase avg. earning /Ha. of Boro rice cultivation.	300
1.10	Assessment of Available Water Resources for Bringing Fallow Lands Under Cultivation in Sylhet and Habiganj (2023-2025)	<ul style="list-style-type: none"> To quantify the fallow land amount in Sylhet and Habiganj To identify water sources and estimate available water resources To figure out a suitable way for irrigating fallow lands 	A working guideline for increasing irrigated cropping area in Habiganj and Sylhet region could be carried out.	100
1.11	Increasing Land Productivity in Valley Area of Hilly Region Through Integrated Minor Irrigation System (2023-2026)	<ul style="list-style-type: none"> To conserve water from hilly stream near valley in dry season To develop appropriate water distribution and application systems for irrigating valley land To bring fallow lands under rice or rabi crop cultivation 	Irrigation facility development using nearby water sources will increase the cropping intensity and land productivity in valley areas of hilly regions.	150
1.12	Sensor-Based Soil Moisture Tracking for Varying Water Level in Paddy Field (2023-2026)	<ul style="list-style-type: none"> To calibrate soil moisture sensors with observed lab and field data To monitor and record continuous soil moisture data over the season To figure out soil moisture dynamics with water level depletion 	<ul style="list-style-type: none"> Precise soil moisture relationship with shallow water table and its effect on crop yield could be identified. 	500

1.13	Sensors and IoT Based automatic precision irrigation system at different water regimes: Performance of an automatic gate (2024-2028)	<ul style="list-style-type: none"> To develop and implement a sensor and IoT-based smart irrigation system to monitor and control water usage that can improve water use efficiency and productivity in rice cultivation To make the irrigation water saving technologies user friendly for the farmers through automation 	<ul style="list-style-type: none"> An automated and user-friendly water saving technology for rice Increased water use efficiency and water productivity 	300
1.14	Study on trend and variability analysis of climatic parameters in different agro ecological zone of Bangladesh (2024-2027)	<ul style="list-style-type: none"> To evaluate long term changes and trends To determine irrigation water requirement by CROPWAT model in different agro ecological zone of Bangladesh To correlate climate change with crop yield 	Irrigation water requirement and plant growth will be determined	100
2.	Utilization of Water Resources in Rainfed Environment			
2.1	Agricultural drought forecasting for mitigating drought in T. Aman rice (2021-2025)	<ul style="list-style-type: none"> To validate drought by using forecasted rainfall and evaporation To mitigate drought by applying supplemental irrigation To determine suitability of drought model for forecasting, and To determine yield performance after mitigating drought 	<ul style="list-style-type: none"> Drought tolerance ability of BRRIdhan71 will be identified for Kushtia region. Effect of supplemental irrigation on yield and yield contributing parameters of BRRIdhan71 will be quantified. 	100
2.2	Irrigation Scheduling of Rice (<i>Oryza sativa</i> L.) Based on Weather Forecasting in Gazipur (2020-2025)	<ul style="list-style-type: none"> To predict water demand through water balance simulation model for rice cultivation To compare performance of water 	<ul style="list-style-type: none"> Irrigation water requirement determination through weather forecasting. Better method for irrigation 	100

		<p>balance simulation model with AWD and conventional methods</p> <ul style="list-style-type: none"> • To validate water balance simulation model with CROPWAT 8.0 model • To recommend the better method for irrigation scheduling of rice 	scheduling	
3.	Land Productivity Improvement in the Coastal Environment			
3.1	Assessment of Water Resources Availability Suitable for Irrigation to Increase Crop Production in Tidal Areas of Barisal Region (2025 to be continued)	<ul style="list-style-type: none"> • To monitor dynamic temporal variation of surface water salinity in the dry season at different locations of Barisal region • To assess constrains and prospects of tidal water utilization for irrigated crop cultivation • To assess availability of water and potentials for irrigated crop cultivation 	<ul style="list-style-type: none"> • Availability of suitable water in terms of salinity for irrigation at different distances from the coast towards the upstream • Guidelines for productivity improvement through assessment of available suitable water resources for irrigation 	100
3.2	Water Resources Assessment During Dry Season Crop Cultivation in Selected Polders of Coastal Region (2017-2026)	<ul style="list-style-type: none"> • To delineate suitable water resources during dry season • To determine the amount of fresh water available for crop production during dry period • To assess cultivable area used for different cropping patterns based on water resources 	<ul style="list-style-type: none"> • Availability of suitable water in rivers and canals in dry season • Productivity improvement through assessment of available suitable water resources for irrigation 	100
3.3	Impact of Saline Water Irrigation and Rice Straw and Gypsum Amendment on Soil Physicochemical Properties and	<ul style="list-style-type: none"> • To evaluate the effect of rice straw and gypsum incorporation and saline water irrigation on soil physical and chemical properties 	<ul style="list-style-type: none"> • Ameliorate of the harmful effect of salinity and improve soil properties • Sustainable use of saline water irrigation for rice cultivation in the 	100

	Rice Yield in The Coastal Saline Area (2021-2025)	<ul style="list-style-type: none"> To find out the effect of rice straw and gypsum amendment on rice growth and yield in the saline area To find out the sustainable saline water irrigation for rice cultivation in the coastal area 	coastal area	
3.4	Performance of hybrid and inbred boro rice under different level of irrigation water salinity in coastal saline area (2024-2026)	<ul style="list-style-type: none"> To assess the hybrid phenological and morphological causes of yield variation under saline condition To identify the suitable rice cultivars for higher yield in the coastal saline area 	Suitable Boro rice varieties with phenological and morphological characteristics will be identified under saline condition	300
3.5	Electrical conductivity sensor and IoT based soil and river water salinity monitoring in the coastal region of Bangladesh (2024-2028)	<ul style="list-style-type: none"> IoT based electrical conductivity measurement of coastal rivers for remotely, frequently and real time monitoring of the water salinity. Assessment of suitable soil and water resources for crop productivity improvement in the coastal regions 	<ul style="list-style-type: none"> Water and soil salinity dynamics in coastal regions Suitable time for closing and opening of the sluice gates in the polders 	300
3.6	Improving water and land productivity by hybrid rice cultivation during Aus season at Subarnachar (2024-2026)	<ul style="list-style-type: none"> To identify the constraints for Aus cultivation at Subarnachar To identify location specific technologies for Aus cultivation to increase land and water productivity at Subarnachar To identify appropriate water management to increase crop production during Aus season To identify appropriate rice varieties to increase crop production during Aus 	<ul style="list-style-type: none"> Constraints of Aus rice cultivation will be determined Appropriate water management will be determined Suitable variety will be determined <p>Economic benefit will be determined</p>	500

		<p>season</p> <ul style="list-style-type: none"> To study the economic benefit of Aus cultivation 		
4.	Sustainable Management of Water Resources			
4.1	Monitoring Groundwater Level Fluctuation and Safe Utilization of Groundwater in Different Geo-Hydrological Regions (1779 to be continued)	<ul style="list-style-type: none"> To determine fluctuation of groundwater level over time and its relationships with rainfall To determine water quality for assessing its suitability for irrigation 	<ul style="list-style-type: none"> Known dynamic behavior of groundwater level in different regions of Bangladesh Awareness development for judicial use of groundwater resources 	100
4.2	Assessment of Surface and Groundwater Quality for Irrigation in Selected Locations of Bangladesh (2029-2025)	<ul style="list-style-type: none"> To determine the surface and groundwater quality parameters To determine the suitability of groundwater for irrigation 	Safe irrigation water sources identification	150
4.3	Present Status and Potentiality for Increasing Rice Cultivation in Surface Water Irrigation Projects of Bangladesh (2021-2025)	<ul style="list-style-type: none"> To determine the present status of major irrigation projects To identify the problems of command area increasing To figure out the improvement options for surface water utilization 	Improvement options of surface water irrigation project	100
4.4	Groundwater Use Potential for Supplemental Irrigation for Boro Rice Production in the Haor Areas (2022-2025)	<ul style="list-style-type: none"> To assess the groundwater availability for Boro rice cultivation To install tubewell 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 	To increase productivity by mitigating water stress at the reproductive phase of rice	500

4.5	Effectiveness of Surface Laid PVC Pipe Irrigation for Boro Rice Cultivation in The Haor Areas (2022-2025)	<ul style="list-style-type: none"> • To develop a portable water conveyance system under undulating condition of haor areas • To minimize irrigation water loss in distribution systems of the LLP schemes • To increase irrigation coverage per unit time 	To increase crop coverage by improving irrigation facilities for Boro production	200
4.6	Estimation of groundwater recharge in Cumilla and Sylhet region (2024-2026)	<ul style="list-style-type: none"> • To evaluate long term changes and trend of GWL • To evaluate rainfall trend • To estimate GW recharge 	Sustainability of groundwater abstraction will be identified	100
5.	Utilization of Renewable energy			
5.1	Development of A Low-Cost DC Solar Water Pump for Irrigation in Bangladesh (2019-2025)	<ul style="list-style-type: none"> • To use a permanent magnet brushless DC motor for operating solar water pump • To find out optimum panel size for good matching between pump and PV module • To test efficacy of the pump for surface water irrigation • To determine economic feasibility of the pump for rice cultivation 	<ul style="list-style-type: none"> • Optimum panel and pump size • Suitability for rice irrigation • Environment friendly technology 	150
5.2	Feasibility Assessment of Solar Pump Utilization for Irrigation Purpose in Chattogram Region (2021 -2025)	<ul style="list-style-type: none"> • To evaluate the present status of solar pumps at field conditions in Chattogram region • To find out the suitable source of water for solar pumping system • To assess the suitability of solar pump system at Chattogram region 	<ul style="list-style-type: none"> • Present irrigation scenario, sources of irrigation water and energy for irrigation pumps • Suitability to use of solar energy in irrigation 	100

6.	Technology Validation in the Farmers' Field			
6.1	Upscaling of Improved Water Management Practices for Sustainable Productivity in the Haor areas (2022-2025)	<ul style="list-style-type: none"> • To document the existing agricultural water management practices for identifying problems and potential 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 for the improvement of irrigation efficiency and optimum crop yield; and • To explore the possibility of increasing crop production by further irrigation expansion. 	Crop and land productivity will be improved	5825
6.2	Mitigating Risk and Scaling-Out Profitable Cropping System Intensification Practices in the Salt-Affected Coastal Zones of the Ganges Delta (2021-2025)	<ul style="list-style-type: none"> • Scaling out profitable cropping system intensification practices • Mitigating risk of changed practices and changing climate 	Crop and land productivity improvement in the coastal area	2628
6.3	Productivity Enhancement through Improved Agricultural Water Management Technologies in the Haor Areas (PIWMH) (2023-2024)	<ul style="list-style-type: none"> • To increase the water resources availability from different sources to ensure optimum irrigation in crop production; • To demonstrate performance of suitable water management technologies for the improvement of irrigation efficiency and optimum 	<ul style="list-style-type: none"> • Ensured irrigation for sustainable crop production • Water saving by around 20% • Increased cultivation area, cropping intensity and productivity • Policy recommendation for agricultural development of haor areas 	5000

		<p>crop yield; and</p> <ul style="list-style-type: none">• To enhance land productivity through cultivation in fallow land and crop intensification in the haor areas.		
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