

TAFSSA Research Platform Trial at BWMRI Dinajpur

Protocol for field
implementation

Research Protocol 1, Work Package 2
December 2022

BACKGROUND/CONTEXT

The Research Platform Trial at BWMRI Dinajpur is part of TAFSSA's Work Package 2 (WP2) activities.

WP2 emphasizes farm- and landscape-level interdisciplinary research to identify strategies to increase farmers' profits and nutritional yields, conserve resources, and maintain or enhance ecological services, while also mitigating greenhouse gas emissions from farms and agricultural landscapes.

Going beyond typical agriculture-nutrition programs in South Asia, we explore field- and landscape-scale crop and animal farm diversification options supporting multiple benefits, including potential nutritional yield, across environmental and socio-economic gradients of rice-based farming systems. Rangpur and Rajshahi divisions in the north of Bangladesh have been selected as learning sites based on key information on food and nutrition security gaps, environmental stresses and climate challenges, as well as the prevalence of commodities and farming systems which offer the greatest potential to achieve TAFSSA's outcomes.

This Research Platform Trial will contribute to the WP2 outputs:

2.1 Evidence informing the development of extension recommendations and materials tailored and appropriate for men, women and farmers from marginal groups to build profitable, equitable farming enterprises that support nutrition.

2.2 A decision support framework tailored to South Asia's farming systems supporting governments and communities in managing nutrition-sensitive landscapes.

2.3 Landscape- and watershed-level assessments of groundwater use sustainability.

2.4 At least two public-private partnerships supporting farm services provision business models that overcome innovation bottlenecks to socially inclusive income generation.

2.5 Open-access peer-reviewed papers, reports and datasets.

As per the Theory of Change of WP2, the Research Platform Trial at BWMRI Dinajpur is part of the first impact pathway that focuses on farm diversification and nutrition-sensitive landscapes, and will contribute to the outcome, "farmers are exposed to innovations and improves management recommendations". This type of action research with national and international research and extension institutes at the

national and sub-national levels will facilitate endorsement and use of outputs 2.1 and 2.3 in development programs implemented by governments, extension agencies and large livelihood-, environment- and nutrition-oriented NGOs. Furthermore, these efforts will be aligned with professional capacity development opportunities for young and women professionals within national research systems to learn about innovative tools and methods for answering complex, multi-scale research questions using interdisciplinary methods.

OBJECTIVES

Test, adapt, target and position agronomic technologies and practices supporting crop (and animal) diversification across the region's farming systems.

In particular, compare and study diverse cropping systems in terms of:

- i. agronomic performance

- ii. yields and nutritional yields
- iii. labor requirements
- iv. profitability
- v. environmental impact

RESEARCH QUESTION

At the farm level, can crop diversification, biofortification and animal components be managed to increase production of nutritious foods and improve women's and men's livelihoods while conserving resources and mitigating GHG emissions?

METHODOLOGY

The Research Platform Trial at BWMRI Dinajpur follows a randomized complete block design (RCBD), with 3 replications. Where applicable it includes split plots (i.e. for different leafy vegetables and biofortified vs. non-biofortified varieties).

Net plot size is 17 m x 11.5 m

Nine diversified cropping patterns are being compared (Table 1).



Above: Research Platform Trial at BWMRI Dinajpur, Oct 23rd 2023. Photo Credit: Stephanie Cheesman

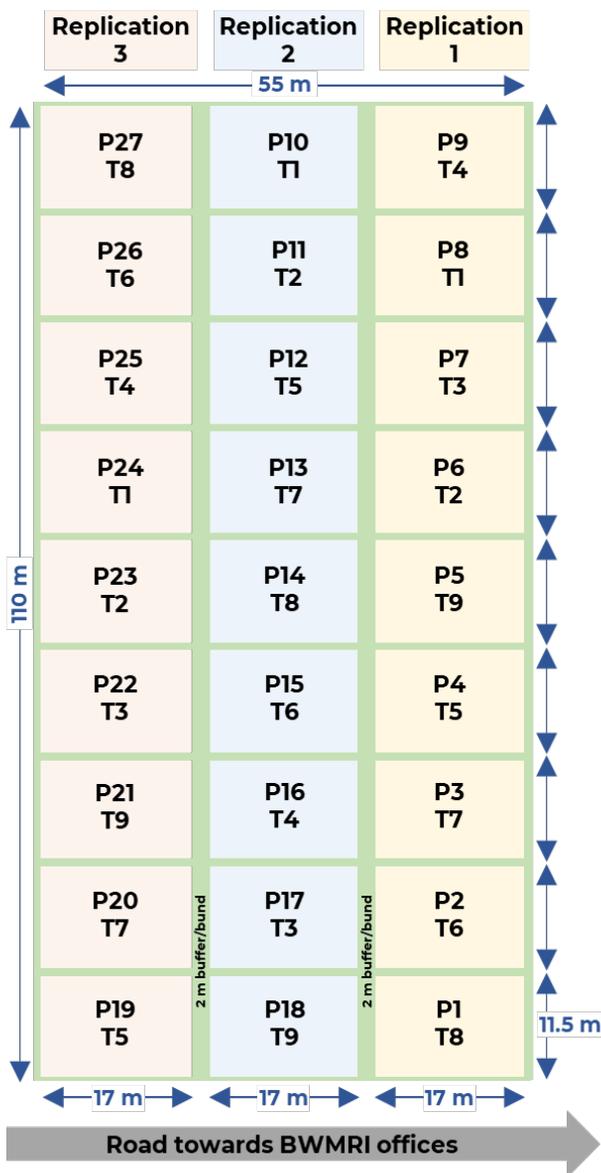
Table 1: Diversified cropping patterns tested

Treatment	Diversification options	<i>Kharif-2</i>	<i>Rabi</i>	<i>Kharif-1</i>
T1	Business as usual - 1	<i>aman</i> rice	fallow	<i>boro</i> rice
T2	Business as usual - 2	<i>aman</i> rice	maize	Fallow
T3	Profitability & improved nutrition	<i>aman</i> rice (SD,BF)	potato	sweet corn
T4	Increased production & improved nutrition	<i>aman</i> rice (SD,BF)	leafy vegetables	<i>boro</i> rice (BF)
T5	Increased production & improved nutrition	<i>aman</i> rice	maize + leafy vegetables	sorghum (fodder)
T6	Diversified production	<i>aman</i> rice	mustard	Groundnut
T7	Diversified production & improved nutrition	<i>aman</i> rice	carrot	maize (early)
T8	Profitability & soil health	<i>aman</i> rice	wheat	Jute
T9	Diversified production & soil health	soybean	mustard	maize

SD short duration; BF = biofortified; leafy vegetables: spinach, red amaranth, coriander, napa shak
aman rice = summer/monsoon rice; *Boro* rice = winter/dry season rice

**Above:** Research Platform Trial at BWMRI Dinajpur, Jan 16th 2023. Photo Credit: Akbar Hossain

FIELD LAYOUT



LOCATION

This Research Platform Trial is hosted at the Bangladesh Maize and Wheat Research Institute (BWMRI) in Dinajpur, GPS coordinates: 25.742715, 88.672334.

DATA COLLECTION

To compare performance and profitability of the various cropping patterns tested, data on a series of parameters is collected across the seasons:

- Soil profile sampling: for 3 points diagonally across the three reps prior to trial establishment; depths: 0–15 cm, 15–30 cm, 30–45 cm, 45–60 cm, 60–90 cm and 90–120 cm
- Soil sampling: a composite soil sample from 5 points collected before land preparation from 0–15 cm and 15–30 cm depths, for each plot and season
- Tillage and phenological information for each crop/plot across each season
- Fertilizer information: rates, timing and method of application
- Pest management: monitor pest and diseases; record any control measures taken
- Weed management: keep plots weed-free during critical stages of respective crop growth; record any control measures taken
- Irrigation information: timing and amount of irrigation water applied
- Labor information: for all field and post-harvest activities
- Harvest data: yield of main crop product as well as leftover biomass; collect samples for nutritional yield analyses (TBD)
- Market price information: for inputs and produce

AUTHORS

Stephanie Cheesman, Post-Doctoral Research Fellow and Cropping System Agronomist, CIMMYT

Md. Washiq Faisal, Research Associate, CIMMYT

Alanuzzaman Kurishi, Research Associate, CIMMYT

Akbar Hossain, Principal Scientific Officer, BWMRI

Annika Jahan Aonti, Scientific Officer, BWMRI

Md. Mobinur Rahman, Scientific Officer, BWMRI

Md. Shakhawat Hossain, Senior Scientific Officer, BARI-OFRD

Mahesh Kumar Gathala, Senior Scientist and Cropping System Agronomist, CIMMYT

Timothy Krupnik, Country Representative for Research and Partnerships and Systems Agronomist, CIMMYT

SUGGESTED CITATION

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To learn more, please contact:

s.cheesman@cgiar.org

To learn more about TAFSSA, please contact:

t.krupnik@cgiar.org; p.menon@cgiar.org

ABOUT TAFSSA

TAFSSA is a CGIAR regional integrated initiative to support actions that improve equitable access to sustainable healthy diets, improve farmers' livelihoods and resilience, and conserve land, air, and water resources in South Asia.

ABOUT CGIAR

CGIAR is a global research partnership for a food secure future. Visit <https://www.cgiar.org/research/cgiar-portfolio> to learn more about the initiatives in the CGIAR research portfolio

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