Integrated Farming (2022-23)

An attempt was made to integrate SWOT (Strengths, Weaknesses, Opportunities, and Threats) – AHP (Analytic Hierarchy Process) analysis for prioritizing the practicing farmers' perceptions on the driving forces as well as limiting factors influencing integrated farming (IF) and determining a strategy plan for practicing IF under a smallholder farming set-up in West Bengal. A comprehensive review of the literature and focus group discussion (FGD) among the Subject Matter Specialists (SMSs) of district Krishi Vigyan Kendra (KVK), Scientists of different Institutes and the farmers were made to identify the factors (to be used in the AHP) under four components, namely Strengths (S), Weaknesses (W), Opportunities (O), and Threats (T) of IF in West Bengal. We identified a total of 32 SWOT factors under 4 SWOT components (8 SWOT factors under each 4 SWOT component) affecting the performance of IF in West Bengal. We used a multi-stage sampling to select 60 practicing IF adopters in West Bengal for data collection on 32 SWOT factors using field observations and face-to-face interviews with a close-ended questionnaire. An individual farm household operating on an IF was considered a primary sampling unit. The questionnaire facilitated the responses against all possible pair-wise comparisons among the SWOT factors using a comparison scale. The participants were asked to evaluate whether the factors in the pair were equally important or whether one was more important than the other. The data obtained from the pairwise comparisons were used to obtain a priority value for each factor. We used the pair-wise comparison data of factors in SWOT analysis for AHP to understand the quantitative importance of each component and factor of SWOT analysis concerning the selection of driving factors and planning strategies on IF in West Bengal. The SWOT-AHP model is shown in Figure 1.
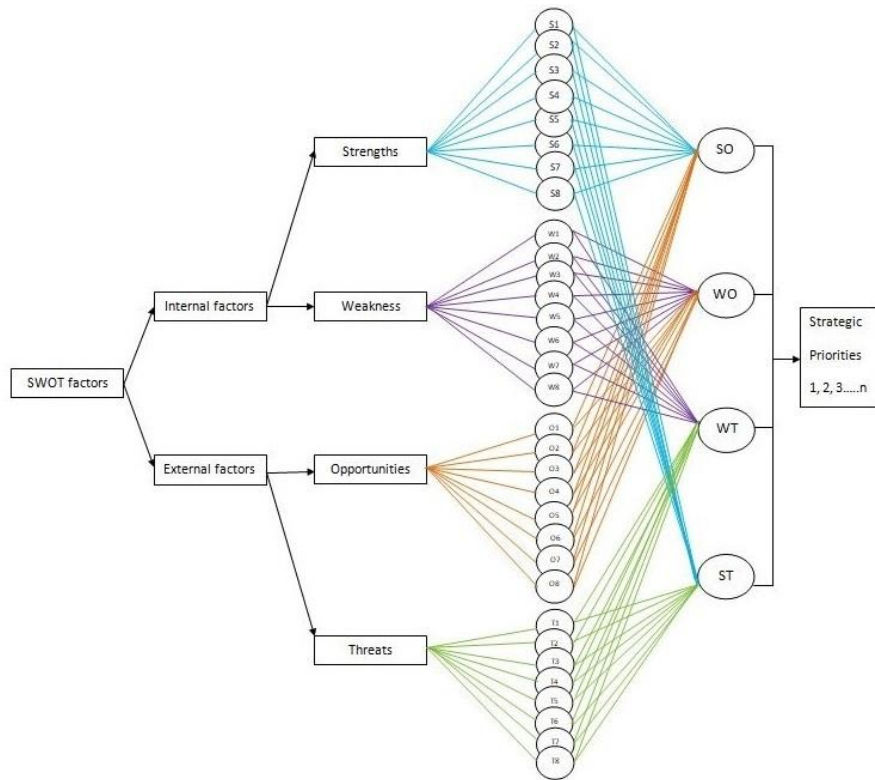
Figure 1: The SWOT-AHP model which follows the following steps: (1) Building the SWOT analysis information through internal factors (Strengths and Weaknesses) and external factors (Opportunities and Threats); (2) Conducting a pairwise comparison of the SWOT factors with relative weights within every SWOT component; (3) Performing a pairwise comparison of the four SWOT components; (4) Using AHP analysis to prioritize each factor in the analysis; (4) Prioritizing and strategy formulation.

The study outcomes appreciated the diversity of farmer values and know-how towards IF in West Bengal, a state of Eastern India. Our study successfully combined a qualitative SWOT analysis model and quantitative AHP analysis to rank strategies in formulating IF system development plans. Results of the multi-criteria analysis showed the total priority weight of the opportunity component was the highest, followed by strength component indicating that the farmers perhaps practiced IF to explore opportunities and strengths. Since the highest preference of the farmers was on the external positive factors of "opportunity" component followed by the internal positive factors of "strength" component, the factors like "sustainable livelihood security", "promotion of organic farming", "better risk management", "incorporation of high-value crops, "climate resilient farming practices" etc under "opportunity" component and "increased farm production and productivity", "enhancement in income", "effective utilization of farm by-products" etc under "strength" component might be the strategical driving factors for accelerating the successful adoption of IF by the farming communities. None of the factors of weakness and threat components could rank within first ten factors. Although less important, the limiting factors (weaknesses

and threats) might be helpful to formulate mitigation strategies for mainstreaming IF in the natural resource management plans. The results obtained from SWOT-AHP analysis would help decision-makers and extension program planners to improve extension services delivery for popularizing towards adoption of IF to the smallholder farmers in West Bengal. A second set of questions was finalized to collect in-depth data which were digitalized for ranking IFs in West Bengal.

Figure 2: An interactive meeting to finalize questionnaires for in-depth data collection on integrated farming

Figure 3: Validation of questionnaires for 2nd phase data collection on integrated farm at the farmers' field in South 24 Parganas District, West Bengal

Figure 4: Visit of integrated farm for 2nd phase data collection on integrated farm at Haldibari, Coochbehar District, West Bengal
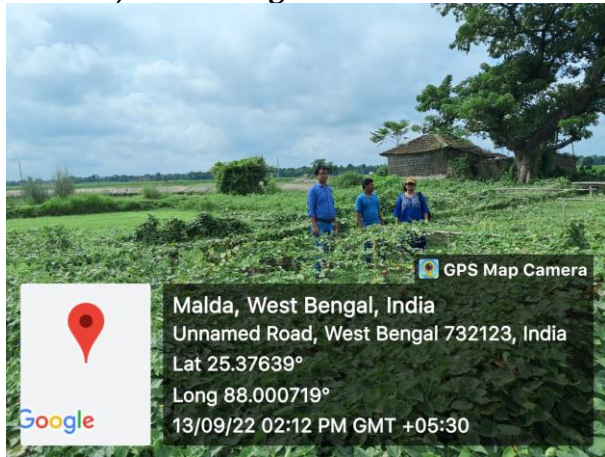

Figure 5: Visit of integrated farm for 2nd phase data collection on integrated farm at Malda District, West Bengal