Mapping of Affordable and Transferrable Food Security-related Technologies - IsDB-FAO-IFAD Partnership

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Abstract

In response to the pressing need for innovative solutions to address food security challenges, a Tripartite Cooperation Agreement between the Islamic Development Bank (IsDB), the FAO Regional Office for the Near East North Africa region, and the International Fund for Agricultural Development (IFAD) conducted a comprehensive "Mapping exercise of affordable and transferrable food security-related technologies". This initiative targets 10 countries where smallholder farmers face different challenges, including Bangladesh, Brazil, Egypt, Jordan, Palestine, Morocco, Nigeria, Tajikistan, Tunisia, and Türkiye. The mapping effort focuses on six technology thematic areas critical to improving food security: 1) postharvest, reducing food loss and waste; 2) water management and water-saving technologies in the face of climate change; 3) sustainable pest control and crop management; 4) e-commerce and market access, 5) fintech; and 6) green energy for farmers. By identifying, analyzing, and cataloging affordable, reliable, and environmentally friendly technologies, the initiative aims to build a knowledge base, a technology assessment framework, and a decision support tool to guide evidence-based investment in promising agricultural technologies within unique contexts.

A total of 228 technologies were screened and evaluated through a multi-level assessment which included 3276 criteria, resulting in the identification of a total of 120 highly viable technologies.

Introduction

IsDB conducted the mapping exercise in collaboration and with matching contributions from IFAD and FAO aims to identify, analyse, and catalogue affordable, reliable, and environmentally friendly agricultural technologies. The initiative aims to build a knowledge base, a technology assessment framework, and a decision support tool to guide evidence-based investment in promising agricultural technologies within unique contexts.

Scope

The scope of the mapping study involved a detailed analysis of various potential technologies beneficial to smallholder farmers across the target countries screened against a structured methodology – developed within this partnership framework - that evaluates and categorizes technologies based on their potential impact, feasibility, and suitability across the following six technology thematic areas critical to improving food security for technology scouting and classification:

In the selection of the types of technologies, a screening criteria and a three-level technology assessment methodology were developed. The screening criteria allowed for narrowing down the thousands of technologies available across different technology databases to a total of 349 technologies across the 6 thematic areas in the 10 target counties *(Bangladesh, Brazil, Egypt, Jordan, Palestine, Morocco, Nigeria,* *Tajikistan, Tunisia, and Türkiye)*. 10 technology directories were created with detailed information for the 349 technologies. A total of 228 technologies were screened and evaluated through a multi-level assessment which included 3276 criteria, resulting in the identification of a total of 120 highly viable technologies.

Methodology

The methodology to screen and evaluate the technologies was co-developed by IsDB, FAO, and IFAD teams. Six thematic areas were identified: i)Post-harvest techniques to reduce Food Loss and Waste; ii) Water management and water-saving technologies; iii) Sustainable pest control and crop management; iv) E-commerce and market access; v) Fintech; and vi) Green energy solutions for farmers. The technologies to be mapped as part of this exercise need to specifically benefit smallholder farmers, be currently implemented in the country of focus, have the potential to improve food security and have the potential for scaling up. Each technology went through two levels of assessment. Under the Level 1 assessment, technologies were evaluated based on affordability, reliability, ease of use, green and environmentally friendly, potential for scaling up and mainstreamed throughout the value chain, enabling environment, as well as social acceptance and empowerment.

Level 2 assessment consists of evaluating the 120 shortlisted technologies (2 technologies x 6 thematic areas x 10 countries) based on a list of 14 sub-criteria that provide a more in-depth insight into the criteria category. For example, the sub-criteria "cost of acquisition" and "cost of operation", provide a more detailed understanding of the "Affordability" of the technology. The step is done through desk reviews and consultations with development partners. The same weights used in Level 1 assessment are used for Level 2 assessment.

Green and Climate Smart Technology Assessment Tool

The assessment methodology and framework were transformed into a decision support tool to streamline technology assessment, enabling adaptable evaluation scores and criteria weights. This tool facilitates in-depth evaluations across the 10 target countries and provides a template for extending similar analyses to new countries, recognizing the diverse perspectives of users in assessing and weighting criteria according to their preferences and priorities.

The tool underwent iterative refinement processes to achieve consensus on its structure and functionality, followed by efforts to enhance operational efficiency and automation. Moreover, rigorous validation was conducted across the 10 target countries, involving multiple debugging sessions to ensure comprehensive functionality. The successful deployment of this tool marks a significant project milestone, offering a consistent and effective method for technology assessment across diverse countries and serving as a foundational resource for future initiatives and collaborations among project partners.

Policy recommendations / Conclusions

Mapping of key sectoral technologies is crucial to identifying and evaluating new and emerging innovative technologies while assessing their potential for mainstreaming within the Bank's development interventions.

Supporting the deployment of proven technologies in IsDB MCs and forging strategic related partnerships from the public, private, and third sectors in the member countries, the global South and the North is of paramount importance to address sectoral-related challenges in Member Countries (such as agriculture, education, health, energy, etc).

Acknowledgments

References

The Mapping Report developed through the partnership is in the final form of editing and is expected to be published in June 2024.