Agroecological TRANSITIONS Programme

POLICY BRIEF

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FarMoRe provides an inclusive digital solution to co-create agroecology at scale for rice production in Vietnam

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KEY MESSAGES

- FarMoRe is a field-level performance assessment app that promotes co-creation exchange between extension agents and farmers. It enables users to monitor change over time through recording and benchmarking practices.
- The social benchmarking feature of FarMoRe allows users to compare their performance metrics against those of peers, promoting a sense of accountability and motivating individuals to align their actions with perceived norms.
- FarMoRe promotes agroecology and supports Vietnam's national sustainability policies by offering traceability functions aligned with goals to reduce chemical inputs and foster green growth.

Background

Vietnam is one of the world's leading rice producers, with rice cultivated on approximately 85% of its arable land. From 1990 to 2023, annual paddy rice production surged from 19.2 million metric tons to 43.5 million metric tons, largely due to improved seeds and agrichemical inputs. In the fertile Mekong River Delta, intensive rice production dominates with double and triple rice cropping, including the use of high-yielding varieties, chemical fertilizers/pesticides, and mechanization. The intensification of agriculture in Vietnam, particularly rice production, has led to significant increases in yield over the last several decades, but this growth has also resulted in the overuse of chemicals. Farmers may resort to excessive use of fertilizers and pesticides to maximize yields, which can lead to soil degradation, water pollution, negative biodiversity impacts, high greenhouse gas (GHG) emissions, and adverse health effects for rural communities.

This overuse of chemicals among rice farmers in the Mekong River Delta has been well-documented in the literature (Berg and Tam, 2012; Thuy et al., 2012; Tran et al., 2023; Van Hoi et al., 2013). To address this, multiple government and overseas development projects have focused on improving efficiency over the last two decades and Vietnam has made considerable advances on the policy side towards sustainable agricultural transformation. However, agrichemical input use remains excessive, as agreed by stakeholders at the workshop on 'Holistic Assessments for Food Systems Transformation' held in Ha Noi in October, 2024. Experts at the event concluded that rice cultivation in the Mekong River Delta is between a Level 0 and Level 2 on Gliessman's (2007) scale of agroecology (see figure 1). According to this scale, rice production in the Mekong River Delta is between conventional agriculture with no agroecological integration (level 0) and substituting alternative practices and inputs (level 2). However, there is a lack of long-term, large-scale data to confirm whether the trends are improving, stable, or worsening.

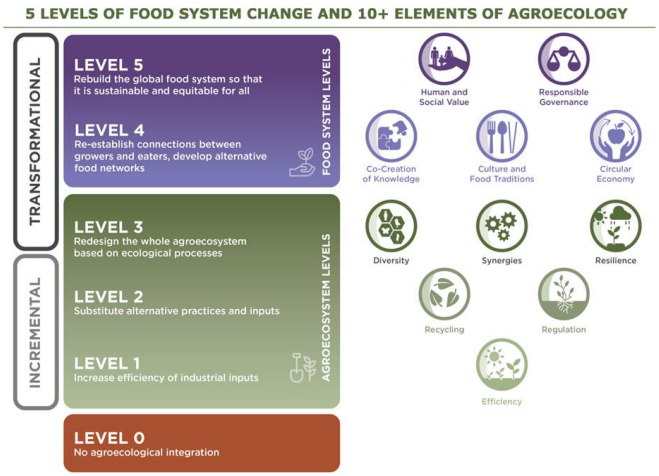

Figure 1. Gliessman´s 5 levels of agroecology and FAO 10 elements alignment (Gliessman, 2007)

This lack of information on farm management practices hinders development planning and implementation. Further, farmers are inundated with biased information and products from input suppliers.

Digital tools remain underutilized in Vietnam's rice production sector, with most apps designed for higher value crops, such as coffee, horticulture, and pepper - which have then been extended to rice neglecting the different needs and resources of rice farmers (Barnard et al., 2022). Existing tools primarily support technical advice without information on the current individual farming practices, inputs, or linkages to markets. These apps often provide generic information or are profit-driven by input suppliers without consideration for the technical or socio-economic barriers and ecological knowledge of rice farmers. This highlights the need for inclusive digital solutions designed specifically for rice farmers.

Policy landscape

Vietnam is a regional leader in terms of sustainable polices as evidenced by the Green Growth Strategy[1] and the National Action Plan on Food Systems Transformation in Vietnam towards Transparency, Responsibility, and Sustainability[2]. There are also several rice-specific policies, such as the Program for Restructuring Vietnam's Rice Sector[3]; Provisions on Land for Rice Cultivation[4]; and the Sustainable Development of One Million Hectares of High-quality and Low Emission Rice[5]. These policies set ambitious targets for reducing chemical inputs, improving resource efficiency, reducing GHG emissions, and increasing sustainable rice cultivation while ensuring stable yields and increased income to promote transformation of the food system.

National sustainability campaigns in Vietnam have adapted over time through a co-creation process between researchers, farmers, field agents, and other stakeholders to embrace a broad set of best management practices that also address GHG emissions (Flor et al., 2021; Connor et al., 2021). This has evolved into the campaign, "One Must-do, and Five Reductions" (1M5R) focused on using certified seed (1 must-do) while reducing seed rate, fertilizer rate, pesticide rate, water usage, and post-harvest losses (5 reductions). This campaign has been widely promoted through projects such as the World Bank funded Vietnam Sustainable Agriculture Transformation (VnSAT) program from 2015-2022. However, there is no standardized guidance to assess performance and benchmark progress of 1M5R. Without this, it is difficult to assess whether farmers are on a path towards improved sustainability that would allow them to access new, higher value markets and to define factors that may be needed for them to reach these goals (i.e., certification and linkages to markets). Through consultations with farmers, field agents and other stakeholders, there was a clear demand for a performance assessment monitoring tool that can also be used for tracking/traceability for both inputs and GHG emissions and for fostering the co-creation of agroecological solutions, citizen science, and social learning while ensuring data accessibility and data privacy. In response to the need for a farmer-centric digital platform that could be used for monitoring progress towards sustainability outcomes, the FarMoRe tool emerged as a strategic innovation and has been a resounding success. FarMoRe has already been implemented across 12 provinces of the Mekong Delta, engaging approximately 600 extension agents, over 20 cooperatives, 7 private sector companies, and 3 research institutes in the Mekong Delta. These extension agents and stakeholder organizations service 120,000 farmers, demonstrating the significant reach and impact of the tool.

Inclusive digital tools for the co-creation of agroecological practices

Rice cultivation varies across landscapes and systems, and is also influenced by socio-economic conditions, knowledge, and interests of the farmers. Tailoring agricultural advice requires knowledge about current farming practices combined with local/indigenous knowledge to co-create agroecological solutions that meet farmers' needs and contribute to broader green-growth priorities. The high variability of farming practices, good digital infrastructure and accessibility, demand from farmers to access higher value markets, and government commitment to supporting sustainable agricultural development were the catalysts for the establishment of the digital tool, FarMoRe – an app and field agent training curriculum designed to 'meet people where they are' by providing performance benchmarking and average peer data to support the co-creation of sustainable solutions.

[1] Decision 1658/QD-TTg, dated 1/10/2021
[2] Decision 300/QD-TTg, dated 28/3/2023
[3] Viet Nam Scheme for Restructuring of Vietnam's Rice Industry by 2025 and 2030. | FAOLEX
[4] Decree 112/2024/ND-CP
[5] Decision 1490/QD-TTg, dated 23/11/2023

FarMoRe is a function of the RiceMoRe smartphone app - a national rice activity data monitoring and reporting system. Co-designed with extension agents and farmers, FarMoRe is built on the principles of agroecology and inclusivity. It enables users to record farming activities and receive a response detailing their performance benchmarked across five categories - seed rate, fertilizer rate, pesticide rate, water usage, and GHG emission estimates. FarMoRe links to the SECTOR GHG calculator[6] via an application programming interface (API) to automatically provide a GHG estimate based on farmer activity data. FarMoRe can also be used to assess change over time, enabling the tracking of improvements in farming activities. Users see where they are on the benchmark and can also see the average performance of other farmers (see Figure 2 for an example of the returned social benchmark results).

The social benchmarking feature of FarMoRe allows users to compare their performance metrics against those of peers. This comparison can build trust in the practices by providing information on what others are doing and it creates a sense of accountability to motivate individuals to align their actions with perceived norms. Evidence shows social information can be an effective mechanism for sustainable behavior change (Composto and Weber, 2022; Zangheri et al., 2019; Farrow et al., 2017). During co-creation sessions, farmers often indicate that seeing this comparison motivates them to adjust their practices to align more closely with the average. Incorporating social information into decision-making processes can also improve the accuracy of judgments. Research indicates that individuals often update their beliefs based on the decisions of others, particularly when they lack confidence in their own judgments. For instance, when faced with complex decisions, people may rely on the choices made by a majority or by trusted peers, integrating this social information into their decision-making framework. This integration can occur either instantaneously or gradually over time, with earlier social information having a more substantial impact on decisions (Tump et al., 2024). For instance, while farmers often lack sufficient understanding of the GHG emissions benchmark, they understand that low emission is better, and if they have higher emissions than the average, they aim to reduce it but often require technical support on how to do this. This critical juncture, where field agents and farmers collaborate, catalyzes the co-creation of agroecological solutions. Therefore, embedding co-creation methodologies within the FarMoRe curriculum becomes essential, ensuring field agents develop skills that focus on farmer knowledge and participatory engagement.

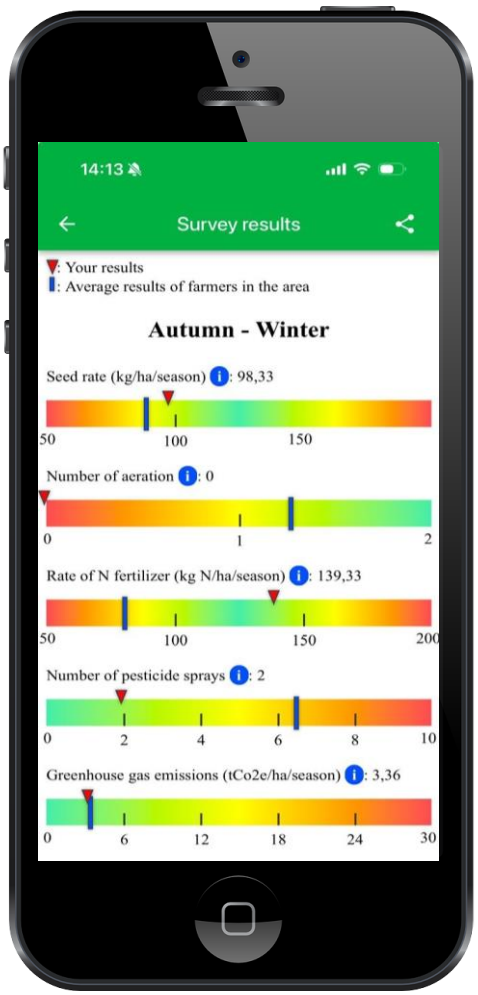

Figure 2. FarMoRe benchmarking results (translated to English)

Notably, social information serves as a feedback mechanism that informs individuals about their performance relative to peers. By regularly providing feedback on how one's actions compare to others, organizations can enable an environment conducive for continuous improvement. Since one of FarMoRe's core objectives is to foster collaboration between farmers and extension agents, the benchmarking feature presents opportunities for farmers and extension agents to share insights, identify best practices, and co-develop solutions tailored to local conditions. This interaction helps build a community of practice where participants feel supported in adopting sustainable agricultural methods and may be more likely to commit to long-term improvements.

By leveraging benchmarking and social information, FarMoRe acts as a powerful tool for decision-making and farmer behavior change, particularly in contexts where learning from the experiences of others is important. When we measured the impact, 49% of farmers in Can Tho province reduced seed rate by an average rate of 16 kg/ha, 44% of farmers reduced nitrogen fertilizer on average by 20 kg/ha, 22% reduced the number of pesticide applications by 1.3 times on average, 50% reduced GHG emissions by 0.4 tCO2e/ha on average, and 31% increased yield by 0.71 tons/ha on average.

Farmers are innovative and constantly changing and responding to new information, technologies, and environmental conditions. Digital tools should also be agile in design to reflect the changing needs of farmers and

[6] https://ghgmitigation.irri.org/resources/mrv-toolbox/sector

market conditions. Where benchmarking excels is in providing a framework for farmers or cooperatives to assess their performance against industry standards or competitors. By understanding where they stand relative to others, farmer organizations can make informed strategic decisions regarding resource allocation, marketing strategies, and operational improvements (Lyseggen, 2017). This process ensures that decisions are data-driven and aligned with best practices within the industry.

FarMoRe allows for the customization of benchmarks according to different guidelines and standards and is specifically designed for flexibility so the app can change over time to assess higher levels of agroecology, different sustainability standards (e.g., Sustainable Rice Platform - SRP, Organic, Fair Trade, carbon credits), or provide traceability for procurement requirements. With administrative access, new campaigns can easily be designed and deployed to the app for use immediately by field agents and farmers. Nonetheless, digital tools do not scale themselves, and to reach scale several important factors were considered, such as inclusive design, local ownership, government priorities and digital transformation initiatives.

Scaling

In Vietnam, the national target program on building New Rural Areas for the period 2021-2025[7,8] aims to enable the goal of building ecological agriculture, modern rural areas, modernized farmers and includes the national digital transformation strategy. With a view towards ecological agriculture, the government strongly emphasized the role of digital transformation as a crucial requirement to effectively and sustainably form “smart” rural areas and improve community operational efficiency.

Scaling agroecological practices through digital tools in smallholder staple food cropping systems, especially in developing countries, requires navigating key trade-offs such as balancing exemplary features with practical scalability, ensuring that advanced functionalities remain accessible and user-friendly for farmers with varying levels of digital literacy. Another critical consideration is aligning ecological standards with economic viability and promoting sustainable practices without imposing burdensome costs on smallholders. Considering these challenges and to ensure long-term operation and scalability of digital tools our strategy for scaling focused on:

- **Local Ownership:** FarMoRe was co-created and tested with diverse stakeholders to meet the actual needs of users, while maintaining simplicity and user-friendliness. As a result, the tool offers a digital solution for assessing and tracking progress towards sustainable transitions for farmers, enables evidence-based advice from extension agents, and provides reliable field-level data for policy making. Therefore, it aligns well with Vietnam's digital transformation strategies and supports sustainable agricultural management to achieve long-term goals. FarMoRe is now owned and operated by the Ministry of Agriculture and Rural Development (MARD) as part of the RiceMoRe system, which was shortlisted for ‘Digital Transition App of the Year’ at the 2024 VTV Awards[9].
- **Sustainability**: The integration of FarMore into MARD’s national agricultural monitoring and management system also demonstrates a modality for sustaining the tool while ensuring it is freely accessible to the public. Since it supports the Government’s agricultural development goals, its operation and maintenance are secured with the state’s resources. This helps to establish stable mechanisms for operation, updates, technical support, and user training, ensuring that the tool remains functional, relevant, and widely accessible over time.
- **Integration with Broader Initiatives**: To gain greater impact and scalability, FarMoRe is anchored within the Digital Transformation Strategy of MARD, whose advisory board expressed interest in using the tool to support the national program on the Sustainable Development of One Million Hectares of High-quality and Low Emission Rice. When scaled through the broader national program, FarMoRe has the potential to directly and indirectly benefit these one million farmers by fostering agroecological transitions that have economic, social, and environmental benefits.

In addition, there is regional interest to expand FarMoRe to other countries, including Cambodia, the Philippines, Thailand, Laos, and Indonesia. FarMoRe was developed with flexibility and scalability in mind, allowing user-identified questions and customizable calculations and benchmarks. Such expansion will enhance regional cooperation in agroecological transitions and strengthen sustainable rice value chains across these key rice-producing countries.

[7] Decision 263/QD-TTg dated on 22 February 2022
[8] Decision No. 924/QD-TTg dated 02 August 2022
[9] Awards ceremony presented by Vietnam Television (VTV), the national television broadcaster of Vietnam

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The FarMoRe tool can be accessed via the QR codes below

For Android device

For iOS device

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The Agroecological Transitions for Building Resilient, Inclusive, Agricultural and Food Systems (TRANSITIONS) Program aims to enable agroecological transitions. The TRANSITIONS Inclusive Digital Tools (ATDT) project aims to support the use of digital resources and citizen science to empower farmers to co-create, adapt, and innovate practices for climate-resilient and low-emission agroecological outcomes at large scales.

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