



Systematic review of digital resources for climate-informed agroecological transitions in rice in the Mekong Delta

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Background

This report summarizes findings from the review of digital resources for climate-informed agroecological transitions in rice in the Mekong Delta in Vietnam. The project “Agroecological transitions for building resilient and inclusive agricultural and food systems” (TRANSITIONS) is funded by the European Commission through its DeSIRA initiative and managed by the International Fund for Agricultural Development (IFAD). The Digital Tools regional work in Vietnam focused on research and engagement with digital tools for technical advice and performance assessment in sustainable rice production in the Mekong Delta due to the high environmental impacts, climate change mitigation potentials and sustainability challenges. The Sustainable Rice Platform (SRP) is the world’s only sustainability standard for rice and is the focus for the digital tool review in Vietnam.

Methodology

The Vietnam team conducted a review of local digital resources for agroecological transitions in the Mekong Delta. A rapid appraisal of digital resources used a combination of primary and secondary research including search engines, innovation databases, application stores (e.g., Google Play Store and Apple App Store) and resources made available by stakeholders. The team identified stakeholders behind the digital disruptions that are benefiting smallholder farmers in the rice value chain in Vietnam. In-depth interviews were conducted with eighteen relevant stakeholders and decision makers, including agritech companies, digital tool developers, agribusinesses, donors and public sector. The main goal of the interviews was to develop relationships, identify potential action partners and to explore the wider agroecological digital ecosystem in the rice value chain in the Mekong Delta. The focus was on resources that provide technical advisory services and/or performance assessment related to rice supply chains, specifically those related to SRP, and others that support outcomes related to climate change and agroecological transitions. The emphasis was on digital tools that are already in use along the rice value chain and the network of organizations supporting them. However, inactive tools were also identified as a learning opportunity for tools that may have not been successful.

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Unfortunately there were no technical advisory or performance assessment tools directly related to SRP that provide scoring or advice as it relates to the sustainable rice standards. Therefore, we broadened the search to include all aspects of sustainability or agroecology that were the focus of digital tools. Overuse of chemicals in rice production and high emissions are common challenges in Vietnam and the majority of technical advisory and performance assessment tools focused on fertilizer use efficiency, pest and disease identification and advice, and methods to reduce or estimate emissions.

The tool review database can be found here: [Local Tool Review Database](#)

Review of technical advisory and performance assessment digital tools with climate change mitigation and agro-ecological functions

Fifteen technical advisory (TA), performance assessment (PA) or technical advisory and performance assessment (TA&PA) digital tools with climate change mitigation and agro-ecological functions were identified. They were reviewed using seventy-five indicators in the areas of agroecology, climate change, scalability and inclusion. Table 1 below shows a summary of the local tool review findings.

Table 1 All local tools providing technical advisory (TA), Performance assessment (PA) or both TA&PA with climate change mitigation and agro-ecological functions (n=15)

Category	Indicator	PA (n=6)	%	TA (n=7)	%	TA&PA (n=2)	%
Agroecology	Weather information	1	16.7	2	28.6	2	100.0
	Water resource information	5	83.3	6	85.7	2	100.0
	Pest and disease information	5	83.3	5	71.4	2	100.0
	Estimates GHG emissions	3	50.0	0	0.0	0	0.0
Tech features	Mobile application	1	16.7	5	71.4	2	100.0
	Excel	5	83.3	2	28.6	0	0.0
	IVR*	0	0.0	0	0.0	0	0.0
	SMS**	1	16.7	4	57.1	2	100.0
	Multiple (e.g. IVR + SMS)	1	16.7	6	85.7	2	100.0
Social inclusion	Vietnamese language	2	33.3	6	85.7	2	100.0
	Informed by citizen science	3	50.0	3	42.9	2	100.0
	2-way communication	0	0.0	2	28.6	2	100.0
	Bundled services	0	0.0	3	42.9	0	0.0
	Extractable data	6	100.0	6	85.7	2	100.0
	Free for use	6	100.0	6	85.7	2	100.0

* Interactive Voice Response

** Short Message Service

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Results from the tool review show that the approach of tool developers for performance assessment and technical advisory include some similarities but there are also key differences. 83% of the performance assessment tools focus on using excel whereas the technical advisory tools commonly use SMS (57%) or multiple tech features (57%). There was no use of Interactive Voice Response (IVR) by any of the TA or PA digital tools. The use of mobile applications was most common in technical advisory tools (71%) and tools with both technical advisory and performance assessment (100%). Water resource information and pest and disease information were both common in all types of tools, ranging from 80-100% prevalence. However, Green House Gas (GHG) emissions estimates were only found in 50% of the performances assessment tools.

Climate change appeared to be considered more in PA tools than in TA tools, and majorly from the perspective of resource use efficiency. Nine out of fifteen tools had a function on water conservation/use efficiency, consisting of five PA tools (83%), three TA tools (43%) and one PA/TA tool (50%). Outcome assessment follows with eight tools, concentrated heavily in PA instruments (6 tools – 100%). The climate-related functions focused more on technical know-how to adapt crop production to climate change affects or to mitigate climate impact than providing quantified analysis. Six tools provided technical assistance on climate change, while only three, all PA tools, performed estimations of GHG emissions.

Social inclusion indicators were very mixed. Almost all of the digital tools were free to use and allowed extractable data. Most of the technical advisory (85%) and the technical advisory and performance assessment (100%) were available in Vietnamese language, whilst only 33% of the performance assessment tools were available for use in Vietnamese. It is likely that the performance assessment tools may not have been designed for direct use by farmers, but by intermediaries such as field agents or researchers. 50% of the TA, 47% of the PA and 100% of the TA&PA tools were informed by citizen science. Two-way communication was not available in the any of the PA tools and was only available in 28% of the TA tools but was available in 100% of the TA&PA tools. Bundled services were only available in technical advisory tools (42%).

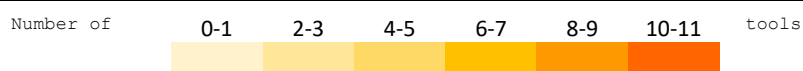
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Review of rice digital ecosystem

A review of the wider rice digital ecosystem was conducted to understand how the priority tools are situated within a wider network of inter-connected applications. Thirty-three digital tools were identified, which does not include the priority technical advisory and performance assessment digital tools with climate change mitigation and agro-ecological functions reviewed in section 3. The 33 tools were categorized and reviewed using inclusion indicators. Table 2 shows a summary of the review.

Table 2 Digital ecosystem for rice-related tools

Character of digital tools	Total	Active		Tech features			Number of crops				Number of countries				
		Yes	No	IVR	Video	SMS	Multiple	1	2-3	4-7	8+	1	2-3	4-7	8+
Agro-advisory	7	7	0	0	1	3	3	2	3	1	1	1	3	1	2
Bundled services*	3	3	0	0	3	3	3	1	0	0	1	1	0	1	1
Climate	1	1	1	0	0	2	0	1	0	0	0	0	0	0	1
Finance	1	1	0	0	1	1	1	0	0	0	1	0	0	1	0
Performance assessment	11	11	0	0	3	5	3	4	3	4	0	7	2	2	0
Performance assessment and agro-advisory	3	3	0	0	1	1	1	1	2	0	0	1	0	2	0
Pests and diseases	5	3	2	0	2	3	2	3	3	0	1	3	1	1	0
Weather	2	1	1	0	0	1	1	1	0	1	1	1	0	1	0



*Bundled services are defined as 2 or more characteristics (e.g. Finance and climate)

The results from this review show 11 out of 33 (33%) of the tools were performance assessment tools whilst seven tools (21%) were agro-advisory and five (15%) tools were for pests and diseases. Of the three pest and disease tools, only one remains active, showing the need for future pest and disease tools to improve on long term engagement. Similarly, of the two weather tools, only one remains active.

IVR was not found to be used in the rice digital tools. 11 of the tools (33%) were using video, eighteen tools (54%) were using SMS and fourteen tools (42%) were using multiple tech features for example, video and SMS.

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Eleven of the tools (32%) were focused on rice as their only crop, with nine tools (27%) focused on 2-3 crops and nine tools (27%) focused on 4-7 crops. Only four tools (12%) were focused on eight or more crops. Fourteen of the tools (39%) were in Vietnam only, with seven (21%) being in 2-3 countries and nine (27%) in 4-7 countries and only four tools were active in eight or more countries. Seven out of the eleven performance assessment tools were only in Vietnam.

Conclusions

In general, there is a relatively small number of digital tools focused on rice production in Vietnam; many of them are developed by a technology company and commissioned by either a state management agency (i.e., agency within the Ministry of Agriculture and Rural Development) or an international development partner (i.e. IFC, Oxfam, etc.). This indicates that digitalisation in the rice sector is approached more from the governance and development perspectives rather than business-driven. Considering that the ultimate goal of rice farmers is profit, it is recommended to include the private sector, particularly value chain players, in this process to stimulate farmer participation and ensure better scaling results.

The studied digital tools for rice production had a variety of functions, ranging from technical advisory, information exchange, record keeping and performance assessment. They generally promote aspects of agroecological and sustainable rice production while mitigating environmental and social impacts, although comprehensive agroecological digital tools are lacking. This is in part due to the need to simplify tools and focus on the most crucial environmental and social challenges facing rice farmers in Vietnam. There is a lack of linkage among the environmental and social benefits across the tools, thus the tools need further integration into the larger digital ecosystem. Similarly, the connection between farmers/producers and other value chain actors, such as input supplier and buyers, is missing. A better connection among these stakeholders would facilitate the linkage between agroecological/sustainable rice production with socio-economic benefits. Requirements for tracking and tracing agroecological standards for certification purposes may encourage better linkage across the value chain which would require market demand for sustainably certified Vietnamese rice. In discussions with market platforms,

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there is demand for SRP certified rice but a lack of supply due to costly certification procedures and complex chain-of-custody requirements. Digital tools should be able to provide solutions to these challenges but they do not currently exist in the digital ecosystem for rice in Vietnam.

Agroecological TRANSITIONS Programme

The Program on Agroecological Transitions for Building Resilient, Inclusive, Agricultural and Food Systems (TRANSITIONS) aims to enable climate-informed agroecological transitions by farmers in low- and middle-income countries through the development and adoption of holistic metrics for food and agricultural systems performance, inclusive digital tools, and transparent private sector engagement. The *Inclusive Digital Tools to Enable Climate-informed Agroecological Transitions* (ATDT) aims to scale agroecological practices by enabling smallholder farmers to participate in co-design of digital tools and farming practices. Learn more about ATDT [here](#).



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