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Workshop Report

Aqua-DST Validation Workshop – Myitkyina, Myanmar

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CGIAR Sustainable Animal and Aquatic Foods Program

The Sustainable Animal and Aquatic Foods (SAAF) Program is part of CGIAR's 2025-2030 Research Portfolio. SAAF works across Africa, Asia, and beyond to improve access to nutritious foods while reducing emissions and supporting inclusive livelihoods. By combining livestock and aquatic systems, it develops integrated, climate- and environment-friendly solutions tailored to local contexts.

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Front cover photo: Workshop participants in Myitkyina, Myanmar. *Photo*: Shelly Win
Back cover photo: Shelly Win

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Exclusive Summary

The Sustainable Animal and Aquatic Food project aims to improve access to nutritious foods while reducing environmental impacts and promoting inclusive livelihoods. By integrating diverse livestock and aquatic systems, the project will offer context-specific solutions to local challenges, enhancing food security and resilience. Our vision is to sustainably transform animal and aquatic food systems in low- and middle-income countries—ensuring they are inclusive, climate-smart, and capable of delivering healthy, nutrient-rich foods to those who need them most.

In 2024 AqFI project, we developed and launched a demo version of an aquaculture suitability decision support tool/model (DST) – Aqua-DST, which helps decide land area suitability for small-scale aquaculture (SSA) and fishponds large-scale at the township level for the improvement, promotion, and expansion in future. The DST built on this analysis will enable informed decision-making that can reduce risks and thus increase the sustainability of fishponds by applying multi-criteria suitability assessments. Now Aqua-DST is upgraded to full version of all including 170 townships which are projected by the results of demo version, this version requires further validations and refinements which are imperative to fully realize Aqua-DST's potential benefits and address potential limitations or uncertainties that may emerge in different climatic and geographic contexts.

For this reason, the Aqua-DST validation workshop was conducted in Myitkyina, Kachin State. A total – of 8 participants, 2 males and 6 females were trained on the understanding of the fishpond criteria indicators, data structures, and exploring the suitability result mapping from the Aqua-DST dashboard.

The half-day workshop program included an introductory presentation, a demonstration of Aqua-DST, group work activities, and group discussions, to understand better the usefulness and usage of Aqua-DST dashboard and its suitability analysis in giving weighting inputs to disseminate the information on decision making that can reduce risks and thus increase the sustainability of ponds. All the workshop outputs and feedback were drawn up by the respective key stakeholders from the aquaculture sector. Participants discussed the townships' suitability categories and scored their feedback and reasons. Workshop organizers conducted brainstorming about the fish species suitability for each region and information related to culturing methods.

Based on the respective output and feedback from the workshop, the Aqua-DST full version will be developed into a better-validated version to approach the mature stage by applying the different use case scenarios. Moving forward, careful planning is essential for handing over to the host department (DoF) and ensuring the long-term sustainability of Aqua-DST, particularly in terms of data updates and consistency beyond project funding. For more effective application by the users, the Aqua-DST dashboard platform needs to be enhanced with specific fish species selection and its respective culturing methods. To achieve lasting impact, we should focus on dissemination pathway by sharing the blog post (in Burmese and English) onto the impactful aquaculture social media platforms such as webpage and journals/magazines under the umbrella of DoF and MFF, but also via the third party platforms like Greenway and Hwet Toe, for widespread adoption among aquaculture communities, connecting stakeholders from top-level decision-makers to grassroots practitioners, as they are the key drivers of aquaculture development.

Introduction

The Sustainable Animal and Aquatic Food project aims to improve access to nutritious foods while reducing environmental impacts and promoting inclusive livelihoods. By integrating diverse livestock and aquatic systems, the project will offer context-specific solutions to local challenges, enhancing food security and resilience. Our vision is to sustainably transform animal and aquatic food systems in low- and middle-income countries—ensuring they are inclusive, climate-smart, and capable of delivering healthy, nutrient-rich foods to those who need them most.

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In this case, a wide range of suitability analysis techniques exist; however, no dedicated attempt has been made to support the direct application of suitability analysis by stakeholders and decision-makers. This is largely due to the significant complexity associated with the analysis process. The aquaculture Decision Support Tool package broaches this gap, providing an evidence-based digital and analytical tool (and supporting guidelines) that can be used to inform the planning and management of aquatic food production systems via suitability analysis.

This suitability analysis will be used to identify high-risk areas subject to flooding and water scarcity through the DST, thereby enabling DoF, MFF, WorldFish and CBOs to guide potential SSA adopters to minimize these risks, increase the sustainability of ponds, and avoid financial loss to adopters. The prevalent impacts of both floods and water scarcity reported by SSAs are notable and reflect the current ad-hoc nature of SSA adoption that leads to poor pond location.

Now Aqua-DST is upgraded to full version of all including 170 townships which are projected by the results of demo version, this version requires further validations and refinements which are imperative to fully realize Aqua-DST's potential benefits and address potential limitations or uncertainties that may emerge in different climatic and geographic contexts. Continued research, validation, and iterative improvements will be essential to harness its capabilities effectively within the constantly evolving climate scenarios. Hence, this Aqua-DST is required to be tested with the different stakeholders commencing validation workshops in 5 regions. And stakeholders' consultation will confirm the database finalization under indicating criteria. Ground truthing should also be conducted for further validation and implementation activities.

Objectives

- Introducing the showcase of the Aqua-DST full version.
- To make validation of the suitability mapping results output of Aqua-DST by using the inputs from different stakeholders from 5 different geographic locations.
- To focus on dissemination pathway and adoption by the next user - host department (DoF).

Targeted Users

The Aqua-DST targets decision-makers and stakeholders who play a key role in land use planning regarding food production within a given area, providing guidance on the potential suitability of land area for a given system. The tool is suitable for application by a range of entities including planners at township and district levels, SSA adopters, MFF members, CSO/CBO, NGOs, private sector input suppliers, research organizations that have an interest in supporting the development of tailored and targeted investments for aquatic food production systems within a given region. The tool may additionally be of interest to institutions engaged in sustainable integrated farming – agricultural and aquaculture development, with the Aqua-DST capable of providing an insight into where integrated aquatic food production systems would be best placed to support human development goals (e.g., improved food and nutritional security and reductions in poverty) or to guard against the negative implications of global environmental change (e.g., climate change).

Study Area

The Upper Ayeyarwady includes 5 states/regions - Kachin, Mandalay, Sagaing, Magway, and Shan. This full version includes 170 townships.

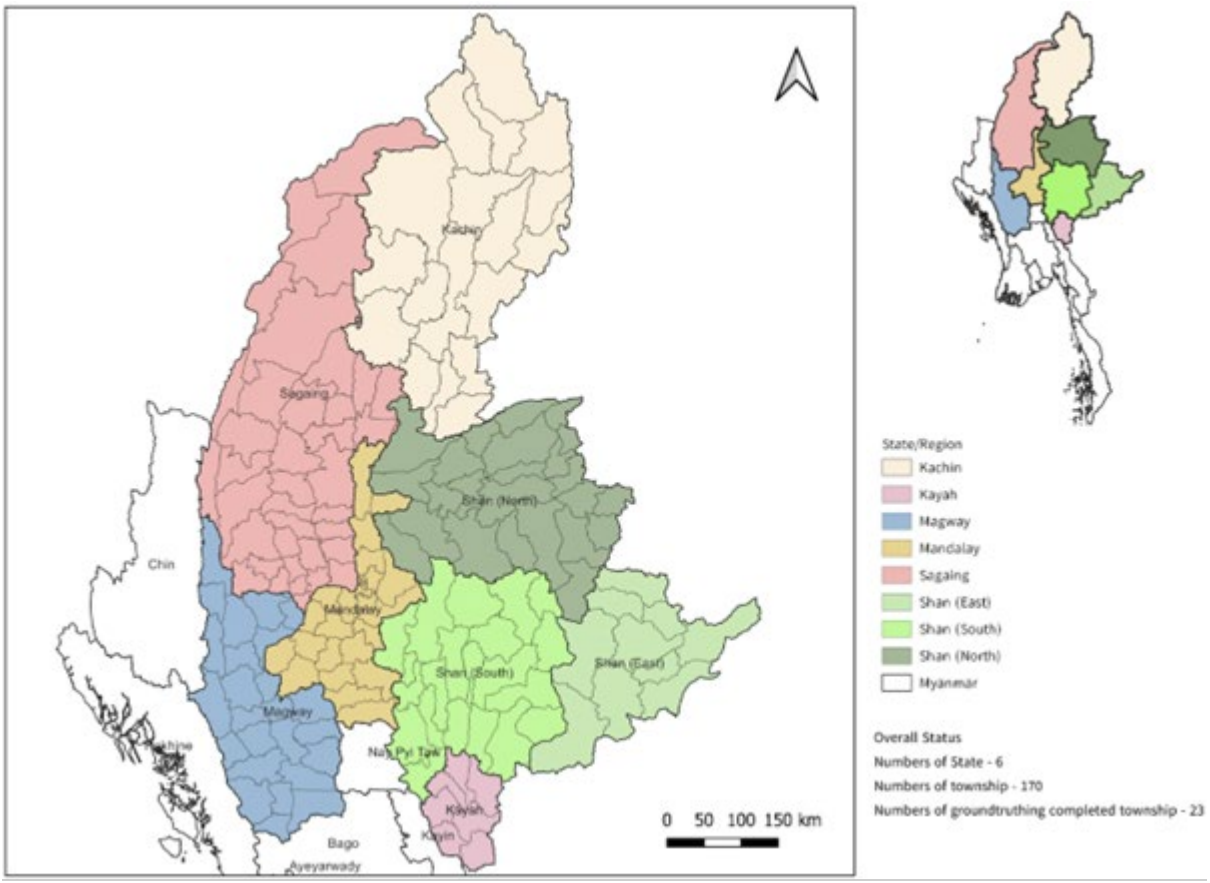

Figure 1. Study Area of Aqua-DST (170 townships)

Summary of the workshop program

The workshop training materials were prepared, translated, and conducted by Dr Shelly Win – Research Consultant who led the validation workshop, and Ms. Aye Chan Myint – Consultant from IWMI who carried out as a facilitator.

According to the agenda in Table 1, the workshop session was opened with the orientation of the overall agenda of the workshop by Aye Chan Myint and then Daw Ohnmar Moe, the Director of DoF Kachin, gave the opening speech for the workshop. Then this was followed by a group photo session. Next after the coffee break session, this was followed by Shelly's presentation about an overview and the development status of the Aquaculture suitability decision support tool (Aqua-DST). The directors from DoF commented that they acknowledged Aqua-DST is basically useful for some extents in future aquaculture development, but it is still needed to improve for specific application within the communities.

Shelly continued the session as follows. The Aqua-DST full version dashboard platform was introduced to the participants by demonstration an explanation of criteria indicators and data structures, suitability result mapping using the use case study of fishpond expansion for cage farming culture. Participants followed the dashboard link and actively explored the key result visualization approach and output suitability mapping results.

After that, Shelly led the group discussion about the validity of suitability mapping results from each group to get feedback from participants based on their ground truth knowledge and experiences. Those results show the suitability levels of the townships for doing aquaculture business. According to the Aqua-DST dashboard, the townships the model works in outfall respectively into 4 categories – least suitable, moderately suitable, suitable, and most suitable. Participants had a chance to score their suitability input and their perspective remarks for all the townships of each region. They agreed with most of the townships' suitability levels as we collected the participants' feedback. There were also arguments from some participants, particularly for the townships, that they knew the more suitability rate according to their field experiences. The workshop organizers led the group discussion sessions

in line with the key questions to brainstorm about the suitable fish species and its best culturing methods for each region. Participants actively discussed and gave feedback and suggestions to approach the better development of Aqua-DST in the mature model before delivering the dissemination though the end-users. Finally, Shelly closed the workshop session with a cheerful closing remark showing the gratitude to DoF.

Workshop Agenda

Table 1. Agenda of workshop

Time	Activities	Presenter	Remark
9:00 – 9:05	Overall agenda	Daw Aye Chan Myint	
9:05 – 9:20	Welcome and Opening remark Group photo and participants' introduction	Director from DoF	
9:20 – 10:00	Aqua-DST overview presentation	Dr. Shelly Win	
10:00 – 10:15	Coffee break		
10:15 – 10:45	Aqua-DST dashboard interface demonstration exercise	Dr. Shelly Win	Hands-on guidebook
10:45 – 12:30	Group discussion 1. Database checking and validation 2. Voting townships ranking for validation the result of Aqua-DST 3. Consolidation of each voting result for group representative result 4. Regional input for the additional Aquaculture themes	Group	Led by group facilitators
12:30 – 12:45	Wrap up session	Dr. Shelly Win	
12:45 – 12:50	Closing remarks	Dr. Shelly Win	

Workshop Participants

A total – of 8 participants, 2 males and 6 females were educated on the understanding of the fishpond criteria indicators, data structures, and application of Aqua-DST dashboard online.

Table 2. Participants Attendance List for Workshop

No	Name	Gender	Designation	Organization	Contact number
1	Daw Ohnmar Moe	Female	Director	DOF	09782089490
2	Daw Roi Taung	Female	Deputy Director	DOF	09781072497
3	Daw Win Win Le	Female	Deputy Director	DOF	095024092
4	Daw Ohnmar Myint	Female	Officer	DOF	092402633
5	U Wai Moe Htun	Male	Officer	DOF	09259786991
6	U Aung Naing Oo	Male	Officer	DOF	09790965573
7	Daw Htet Nge Nge Htun	Female	Deputy Officer	DOF	09757843732
8	Daw Dau Naw	Female	Assistant Officer	DOF	09440004437
9	Aye Chan Myint	Female	Consultant	IWMI	09458489918
10	Shelly Win	Female	Consultant	IWMI	095096391

Main outcomes

Finalized validation of suitability map

The Aqua-DST was run with workshop participants from different geographic locations and getting the input scoring to the suitability levels and their respective remark.

According to the justification results from the validation of Aqua-DST presented in Figure 2, participants fully agreed with the suitability scores generated by the Aqua-DST full version for 10 townships in Kachin State. However, some adjustments were suggested for the other 8 townships based on local field experiences.

The representatives indicated that **Shwegu, Tanai, and Putao** should be reclassified as **suitable (rank 3)**, due to the presence of active fish farming communities and ongoing aquaculture development in those areas such as a recently new hatchery cite in Putao. In contrast, **Hpakant, Injangyang, Chipwi, Sumprabum,** and **Khaunglanphu** were suggested to be downgraded to **rank 1 (least suitable)** because of remoted areas with limited aquaculture facility access and challenging climate conditions.

Considering these local insights, it is recommended that the Aqua-DST database be updated accordingly to reflect the validation findings and ensure context-specific accuracy.

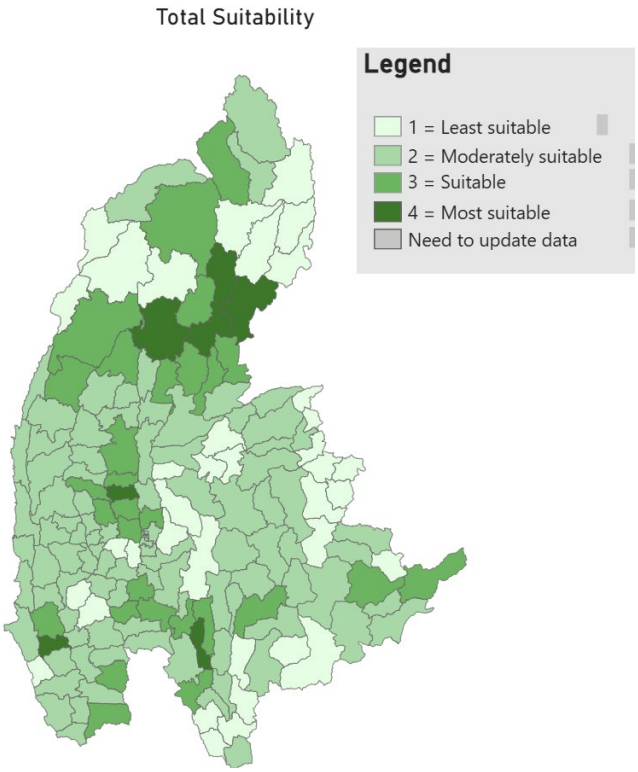

Figure 2. Aquaculture land Suitability map resulted from Aqua-DST validated model

Next, the participants made the group discussions for the inputs of fish species suitable for each region and their culturing methods. Table 3 shows the most suitable and common fish species for each region and their most common and suitable fish culturing methods.

Table 3. Fish species and its most common culturing methods for each region

No	Township	The most suitable fish species (max. 3 most dominant)			The most suitable fish culture (max. 3 most suitable)		
1	Mansi	Rohu	Silver Carp	Sliver Barb	Earthen Pond		
2	Momauk	Rohu	Catla Catla	Common Carp	Earthen Pond		
3	Bhamo	Rohu	Silver Carp	Catla Catla	Earthen Pond	Cage Culture	
4	Shwegu	Rohu	Mrigal Carp	Catla Catla	Earthen Pond		
5	Mogaung	Rohu	Common Carp	Sliver Barb	Earthen Pond		
6	Mohnyin	Rohu	Common Carp	Pacu	Earthen Pond		
7	Hpakant	Rohu	Common Carp	Sliver Barb	Earthen Pond	Tarpaulin Pond	
8	Tanai	Rohu	Common Carp	Sliver Barb	Earthen Pond		
9	Injangyang	Common Carp	Silver Carp	Sliver Barb	Earthen Pond	Tarpaulin Pond	

10	Myitkyina	Rohu	Common Carp	Pacu	Earthen Pond	Tarpaulin Pond	
11	Chipwi	Big Head Carp	Common Carp	Sliver Barb	Earthen Pond	Tarpaulin Pond	
12	Waingmaw	Pacu	Common Carp	Sliver Barb	Earthen Pond		
13	Tsawlaw	Grass Carp	Common Carp	Sliver Barb	Earthen Pond		
14	PutaO	Grass Carp	Silver Carp	Big Head Carp	Earthen Pond	Tarpaulin Pond	
15	Sumprabum	Grass Carp	Silver Carp	Big Head Carp	Earthen Pond	Tarpaulin Pond	
16	Machanbaw	Grass Carp	Silver Carp	Big Head Carp	Earthen Pond	Tarpaulin Pond	
17	Khaunglanhpu	Grass Carp	Silver Carp	Big Head Carp	Earthen Pond	Tarpaulin Pond	
18	Naungmon	Grass Carp	Silver Carp	Big Head Carp	Earthen Pond	Tarpaulin Pond	

Challenges

The main challenges identified for aquaculture development in the study areas include policy-related constraints, such as the lack of clear aquaculture policies, prioritization bias favoring agriculture over aquaculture, and unclear land use regulations. Additional barriers include the absence of a centralized platform for information sharing, limited budgetary support, inadequate banking and microfinance services for fish farmers, and weak coordination among government departments, institutions, and local communities.

Moreover, during the data collection phase, accessing reliable data from partner organizations proved difficult, and in some cases, there were no available references for essential secondary data. Another critical issue is the limited engagement from the Department of Fisheries (DoF) with our Aqua-DST application. This was especially evident in Upper Myanmar, where the project is focused—an area currently outside the main economic development zones and experiencing reduced government control due to ongoing political conflict. As a result, interest and support from key stakeholders appeared limited.

Conclusions

The main objective of the workshops is to introduce the showcase of Aqua-DST full version and to make validation of the suitability mapping results output from Aqua-DST by using the inputs of different stakeholders from different geographic locations. The half-day workshop program included a presentation, a demonstration of Aqua-DST, group work activities, and group discussions, to better understand the usefulness and application of Aqua-DST and its suitability analysis to disseminate the information on decision making that can reduce risks and thus increase the sustainability of ponds. A total of 8 participants – 2 males and 6 females were educated on the understanding of the Aqua-DST application and suitability result mapping. All the workshop outputs and feedback were drawn up by the respective key stakeholders from DoF. Participants discussed the townships' suitability categories and scored their feedback and reasons. Workshop organizers conducted brainstorming about the fish species suitable for each region and information related to culturing methods. Based on the respective output and feedback from

the workshop, the Aqua-DST full version will be developed into a better-validated version to approach the mature stage by applying the different use case scenarios.

Recommendations and next steps

IWMI successfully conducted the workshop focusing on the validation of the aquaculture suitability decision support tool (Aqua-DST). Based on the outputs of the workshop, we hereby provide a few recommendations for further dissemination process.

1. It is necessary to build up a strong connection between government sectors (DoF staff) to work closely together with different implementing agencies and organizations, NGOs including IWMI, and farmer leaders in the region in terms of the application of the model and sharing the suitability results of the model.
2. Careful planning is essential for handing over to the host department (DoF) and ensuring the long-term sustainability of Aqua-DST, particularly in terms of data updates and consistency beyond project funding.
3. For more effective application by the users, the Aqua-DST dashboard platform needs to be enhanced with specific fish species selection and its respective culturing methods.
4. To achieve lasting impact, we should focus on dissemination pathway by sharing the blog post (in Burmese and English) onto the impactful aquaculture social media platforms such as webpage and journals/magazines under the umbrella of DoF and MFF, but also via the third party platforms like Greenway and Hwet Toe, for widespread adoption among aquaculture communities, connecting stakeholders from top-level decision-makers to grassroots practitioners, as they are the key drivers of aquaculture development.
5. In the upcoming months, Aqua-DST will be upgraded with a comprehensive database and modified into a better and easier version and after that, hands-on training of Aqua-DST will be conducted and delivered to relevant stakeholders in Yangon. The trainee selection should be carefully conducted based on these end-user ratios and their computerized skills. An online seminar will be also conducted for all online stakeholders interested in new technologies and aquaculture development.

Annex: 1 Pictures from the workshops

(Photos: Shelly Win, IWMI)

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