NURTURING GREEN AQUACULTURE IN MYANMAR

FINAL EVALUATION

PREPARED BY SMART INSIGHT CONSULTANCY LTD
JULY 2025

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Executive Summary

The Nurturing Green Aquaculture in Myanmar (NGA-Myanmar) programme, was implemented by Mercy Corps Netherlands (MCNL) in partnership with Village Link (Myanmar digital services company) and Daung Capital (a Myanmar fintech company), aiming to support increased environmental sustainability and resource efficiency in Myanmar's aquaculture sector particularly targeting to support micro, small, and medium enterprises (MSMEs)—including vast number of aquaculture producers in the Yangon-Ayeyarwady aquaculture corridor. The programme was funded by the European Union through the SWITCH-Asia Grant Facility.

The programme was implemented from January 1, 2022, with an initial end date of December 31, 2024. Following a six-month no-cost extension, NGA-Myanmar concluded on June 30, 2025. The programme's core objective was to promote cleaner fish production through the adoption of Green Aquaculture Practices (GrAqPs), leading to reduced water pollution and carbon emissions within the Ayeyarwady Delta ecosystem. To ensure lasting impact, the programme combined knowledge exchange, digital integration, and supportive measures—such as facilitating access to green finance—to strengthen the uptake of cleaner production practices and sustainable technologies.

To drive adoption at scale and promote behaviour change across the sector, NGA-Myanmar employed a tiered approach aimed at achieving economies of scale and reaching a tipping point for scalability and sustainability:

- *Tier 1 – Champions*: As the foundational step, a targeted group of approximately 250 MSME producers were trained as *Champions*. These producers actively engaged in testing and refining the promoted GrAqPs. They participated in a structured series of capacity-building trainings and exposure visits, hosted at *Demo Ponds* located in aquaculture production centres across selected townships.
- *Tier 2 – Early Adopters*: Building on the experiences of the Champions, the promoted practices and technologies were introduced to an additional 2,000 producers referred to as *Early Adopters*. These participants were exposed to the benefits of GrAqPs and supported in implementation through peer-to-peer learning from the Champions. A highlight of this phase was the *Field Day Events*, where Early Adopters interacted with Champions and value chain actors to gain practical insights and learn how to access key services and inputs.
- *Tier 3 – Scaling with Technology Integration*: To expand adoption more broadly, the programme integrated the tested GrAqPs into *Htwet Toe*, a farming application developed by Village Link. This digital integration allowed for widespread dissemination of practical guidance and tools to support adoption. This final tier targeted at least 20,000 producers, categorized as the *Early Majority*, enabling broad-scale behavioural change across the aquaculture sector.

This final evaluation report outlines the findings from desk reviews, quantitative surveys, and qualitative interviews conducted according to the criteria outlined in the Scope of Work (SOW). The report is structured around the programme's evaluation criteria: relevance, coherence, effectiveness, efficiency, impact, sustainability, and cross-cutting themes.

Relevance

The NGA Myanmar programme was well aligned with participants' priorities, expected outcomes, and goals. All respondents indicated that the programme remained consistently relevant to their work and that green aquaculture practices were practical and applicable. Based on interview and survey responses, the evaluation team confirmed that the programme effectively addressed participants' needs and priorities.

The programme provided essential knowledge on green aquaculture and raised awareness among participants. Field data showed that participants understood the intent of the intervention, particularly in relation to fishpond preparation. Champion MSMEs applied the correct amount of lime, fertiliser, and animal dung using appropriate methods and regarded these practices as important to their operations.

Technical trainings, water testing, the provision of tools for monitoring water quality, and the promotion of eco-friendly methods were highly appreciated. These activities increased awareness of resource efficiency and, to some extent, contributed to reducing environmental degradation in Myanmar's aquaculture sector. Overall, the programme's objectives and activities were found to be highly relevant, and the promoted green aquaculture techniques proved practical and beneficial for aquaculture businesses.

Given the programme's strong alignment with participant needs and priorities, and the practical applicability of green aquaculture practices, there is strong potential to expand the programme to other aquaculture-producing regions in Myanmar. Stakeholders suggested that similar interventions would be beneficial in other locations facing comparable environmental and resource efficiency challenges. Scaling the approach could further promote sustainable aquaculture practices nationally and amplify the programme's impact.

Coherence

The NGA Myanmar programme was coherent with the goals of the SWITCH-Asia Grant Facility of the European Union, which aimed to support MSMEs in adopting cleaner and more sustainable fish production methods. The programme was strongly aligned with SWITCH-Asia's objectives through its strategic focus on the Yangon–Ayeyarwady aquaculture corridor and the introduction of green aquaculture practices and technologies.

Additionally, the promotion of green aquaculture aligned with the National Aquaculture Development Plan (NADP) and contributed to several Sustainable Development Goals (SDGs), including Gender Equality, Decent Work and Economic Growth, Responsible Consumption and Production, Climate Action, and Life Below Water.

This integrated and strategic approach demonstrated coherence with donor priorities, national policies, and the broader sustainable development agenda.

Effectiveness

The programme aimed to support micro, small, and medium aquaculture producers in adopting more resource-efficient and cleaner production practices. Based on available data and interview findings, the programme successfully achieved its intended outcomes and objectives.

Respondents commonly reported adopting key practices such as monitoring water temperature, pH, water clarity, and ammonia levels. They also regularly conducted visual assessments of water colour and odour, alongside improved feeding management and disease prevention measures.

Programme activities, particularly monthly water quality monitoring exercises, strengthened participants' understanding and application of proper aquaculture practices. These efforts contributed to improved water quality monitoring and enhanced day-to-day operations among Champion MSMEs.

While uptake was strong among Champions, some participants—particularly those less directly engaged—showed varied levels of adoption. Continued support and tailored follow-up may help these producers fully integrate the promoted practices and maximise benefits.

Overall, the evaluation team found the programme to be highly effective in promoting sustainable aquaculture practices.

Efficiency

The programme's outputs were largely delivered in line with intended outcomes. Mercy Corps led implementation in close partnership with Village Link, and both organisations provided effective oversight to ensure quality delivery and adherence to the projected budget. Mercy Corps ensured compliance with donor policies through systematic monitoring and reporting.

Village Link managed field-level activities and played a key role in establishing microfinance linkages and delivering women's empowerment training. The inclusion of aquaculture experts from Vietnam added value by exposing MSMEs to resource-efficient practices. Staff from both implementing partners demonstrated strong technical capacity, contributing to the programme's overall success.

However, the programme faced some efficiency constraints, particularly around coordination during peak implementation periods. Limited staffing and communication challenges in remote areas occasionally caused delays. While digital tools such as Htwet Toe were used to increase outreach, internet connectivity issues reduced their effectiveness in some locations.

Despite these challenges, the evaluation team found the programme implementation to be efficient.

Impact

The programme had a notable impact on several fronts: water quality control, feed conversion ratios, the use of natural feed alternatives, pond preparation techniques, and disease prevention. These outcomes contributed to improved environmental conditions, especially through the reduction of water pollution and increased income from better yields and operational efficiency.

An unexpected positive outcome was the formation of strong peer networks among Champion MSMEs across clusters. These networks fostered information sharing and the adoption of green practices through demo ponds and informal exchanges.

That said, the depth of impact varied across participants. While Champions and Early Adopters showed strong uptake, some producers—particularly those reached primarily through digital channels—required more time or support to fully adopt the promoted practices. In some areas, limited access to affordable inputs and ongoing advisory services constrained more consistent behavioural change.

Sustainability

The programme effectively raised awareness of green aquaculture practices and technologies among Champion MSMEs and their wider networks in the Yangon–Ayeyarwady corridor. Participants gained significant knowledge about efficient resource use and environmental protection, particularly in relation to water quality and effluent management.

Many elements of the programme demonstrated strong potential for sustainability, especially those linked to income growth and improved business operations, which motivate continued practice adoption.

While ongoing access to capital and technical services remains important, the programme has laid a solid foundation for lasting change. Continued engagement and support mechanisms—particularly for digitally engaged participants—can help maintain momentum and further embed sustainable practices across the sector.

Cross-cutting

The programme's Gender Equality and Social Inclusion (GESI) activities strengthened participants' understanding of gender equality and encouraged greater female participation and leadership in aquaculture enterprises. Participation was reported to be inclusive and gender-sensitive, with no known instances of harm or exclusion affecting either male or female participants.

Nonetheless, more targeted follow-up could have helped reinforce GESI outcomes. In certain locations, women's participation remained limited by time constraints or social norms. Future initiatives would benefit from more intentional engagement with male family members to foster shared responsibilities and support more equitable outcomes.

Lessons Learned

- *Feed Conversion Ratio (FCR)*: The programme successfully introduced FCR as a key management tool, with most participants embracing its benefits in improving feed efficiency and fish growth. While a few misconceptions remain, these present an excellent opportunity for deeper engagement and clarification to further empower small-scale producers.
- *Access to Finance*: The programme made strong strides in expanding financial access through innovative platforms and partnerships. Although loan uptake was cautious due to

broader economic conditions, the groundwork was laid for a more inclusive financial ecosystem. There is clear momentum to build on, especially by enhancing financial literacy and the established aquaculture-friendly loan products.

- *Demonstration Ponds*: These hands-on learning spaces were highly effective in promoting peer-to-peer knowledge exchange. Participants responded enthusiastically to seeing green aquaculture in practice, sparking increased adoption. Aligning evaluation timelines with production cycles in the future will allow even more robust measurement of success.
- *Farmer-Led Data Collection*: The active participation of youth and farmers in water quality monitoring was a standout success, building both environmental awareness and farm management skills. With additional training in stream-level monitoring and basic data analysis, participants can take even greater ownership of sustainable practices.

Key Recommendations

- *Strengthen FCR Application*: Build on the strong foundation already established by expanding technical coaching, practical demonstrations, and peer learning. Helping farmers track feed use and performance will further improve efficiency and profitability.
- *Expand Financial Access and Literacy*: Continue to empower MSMEs by strengthening their understanding of financial tools and encouraging responsible borrowing. At the same time, work with financial institutions to develop tailored, aquaculture-aligned products to meet sector needs.
- *Enhance Monitoring and Record-Keeping*: Support farmers to consistently track growth, feed use, and income to inform smarter decisions. Aligning evaluation with harvests will allow for better insights and continuous improvement.
- *Maximize Demonstration Pond Value*: Keep using demonstration ponds as dynamic, practical learning spaces throughout the production cycle. Empowering champions to lead monitoring efforts can build confidence and inspire wider replication.
- *Promote Inclusion Through GESI*: Future efforts can deepen community-level understanding of gender equality and inclusion. Elevating the role of women and underrepresented groups as leaders and innovators in aquaculture will further strengthen impact.
- *Accelerate Digital Innovation*: Build on MSMEs' enthusiasm for IoT and digital tools by embedding them into training programs—especially those targeting youth, who are well-placed to drive innovation.
- *Leverage Local Support Systems*: Field Monitoring Caseworkers (FMCs) played a vital role and should be engaged from the outset. Their presence ensures responsive, community-driven implementation and sustained engagement.
- *Ensure Long-Term Impact*: Ongoing access to technical support—via platforms like Htwet Toe—can help maintain momentum. Continued youth involvement and refresher training will support the growth and resilience of green aquaculture beyond the programme's lifecycle.

Conclusion

The final evaluation confirms that the NGA Myanmar programme made a meaningful contribution to sustainable aquaculture development among target participants. Core practices were well understood and adopted by participants, with positive spillover effects observed in surrounding clusters.

While overall outcomes were positive, the programme noted some variation in the depth of uptake among participants (e.g., between those engaged directly and engaged only digitally). Strengthening access to green finance, providing continued advisory support, and reinforcing gender-responsive approaches could further enhance the scalability and sustainability of impact.

As participants sustain and expand the use of green aquaculture practices, improvements in productivity as well as water quality and environmental conditions are expected to continue over time.

Contents

Acronyms

MFF	Myanmar Fisheries Federation
NGA-Myanmar	Nurturing Green Aquaculture in Myanmar
MCNL	Mercy Corps Netherlands
MSMEs	Micro, Small, and Medium Enterprises
IoT	Internet of Things
GrAqPs	Green Aquaculture Practices
SEA	Strategic Environmental Assessment
GESI	Gender Equality and Social Inclusion
CARM	Community Accountability Reporting Mechanism
MFIs	Microfinance Institutions
ICAFIS	Centre for Aquaculture and Fisheries Sustainability
KIIs	key informant interviews
IDIs	In-Depth Interviews
FGDs	Focus Group Discussions
ToR	Terms of Reference
PII	Personally Identifiable Information
FCR	Feed Conversion Ratio
NADP	National Aquaculture Development Plan
SDGs	Sustainable Development Goals

1. Introduction

The aquaculture sector in Myanmar is significant as it contributes to food security and affordable and nutritious food sources, especially for the poor population. It also plays a crucial role in national and regional socio-economic development, particularly in the rural economy. The aquaculture sector spans nearly 200,000 hectares, primarily located in the Yangon-Ayeyarwady aquaculture corridor. According to data from the Myanmar Fisheries Federation (MFF), these fishponds are operated by approximately 100 medium- to large-sized companies and thousands of small and micro-enterprises. Ponds smaller than 10 acres constitute 49 per cent, while ponds between 10 and 50 acres account for 32 per cent, with numerous smaller ponds of less than 0.5 acres often owned by paddy-farming households.

Due to the excessive number of fishponds, there are concerns about the environmental impact of the aquaculture sector, which may lead to high levels of water and air pollution from the polluted effluent discharged into the delta ecosystem (the natural water bodies) and the unsystematic disposal of waste (such as dead fish and feed residual). The unregulated use of fish feed and fertiliser for increased production can potentially deteriorate water quality (e.g., algae blooms). Consequently, the contaminated water released into water bodies endangers the survival rate of aquatic organisms, making rivers and streams in the delta unsafe. This not only threatens the capacity of resources to support livelihoods, particularly subsistence fisheries within downstream communities, but also jeopardises their access to safe drinking water. [1]

1.1 Programme Background

The EU-funded Nurturing Green Aquaculture in Myanmar (NGA-Myanmar) programme, was implemented by Mercy Corps Netherlands (MCNL) in partnership with Village Link (Myanmar digital services company) and Daung Capital (a Myanmar fintech company), aiming to support increased environmental sustainability and resource efficiency in Myanmar's aquaculture sector particularly targeting to support micro, small, and medium enterprises (MSMEs)—including vast number of aquaculture producers in the Yangon-Ayeyarwady aquaculture corridor. By creating access and providing adoptable cleaner production practices and technologies such as micro circular economies to return nutrients to the ecosystem, internet of things (IoT) smart devices and lower-end green tech, target participants would increase their productivity and be able to manage waste from commercial and farm-made fish feed, fertilisers and chemicals resulting in reduction of water pollution and carbon emissions in the Ayeyarwady delta eco-system[2]. The programme was implemented between January 1, 2022, and with an initial end-date of December 31, 2024. With a no-cost six-month extension, NGA-Myanmar was completed on June 30, 2025.

The programme has targeted a total of 250 champion MSMEs who participated in intensive pond-level demonstrations (demos) expected to boost the compliance with Green Aquaculture Practices (GrAqPs). Extensively, the programme held events days at pond-level practical demonstrations for champion MSMEs, targeting 2,000 MSMEs to participate, aiming to enable the cohorts to adopt green aquaculture practices and technology. To raise awareness about green tech and environmental impact related to aquaculture, 22,250 individuals were targeted to be onboarded to the Htwet Toe app, providing access to technical advisories and video content on GrAqPs, weather, market information, and other services. The programme covers 79 villages in the townships of Maubin, Nyaungdon, Pantanaw, and Kyaiklat in the Ayeyarwady Region, as well as Twantay and Htantabin townships in the Yangon Region.

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[1] *2. Annex A2 - Mercy Corps Netherlands - Nurturing Green Aquaculture in Myanmar - EC Switch Asia _10Dec21*
[2] *2. Annex A2 - Mercy Corps Netherlands - Nurturing Green Aquaculture in Myanmar - EC Switch Asia _10Dec21*

The programme activities were carefully designed with a clear and straightforward programme goal, aligning with the initial concept note, which focuses on improving resource efficiency and reducing environmental degradation in Myanmar's aquaculture industry, while ensuring enhanced economic returns throughout the value chain. The specific objective aimed to encourage champion MSMEs to adopt crucial and desirable greener aquaculture practices and green technology. To promote green aquaculture practices, the programme implemented customised loan or credit options for champion MSMEs and initiated a marketing campaign for green technology and green aquaculture financing through the Htwet Toe application, which provides access to green aquaculture technology and other valuable information.

To further demonstrate green aquaculture practices, the programme organised event days for champion MSMEs at the designated demonstration ponds, connecting them with private sector inputs and technology vendors. Moreover, champion MSMEs received follow-up technical support and collaboration with private technology companies, either through workshops or interactions, to better showcase green aquaculture practices, aiming to encourage peer MSMEs within the cohort of 2,000. The programme also aimed to engage the cohort of MSMEs in participating in learning events and demonstration ponds focused on green aquaculture practices. Another significant activity implemented by the programme was water quality monitoring, both at the pond site and downstream, aiming to reduce the water quality impacts of pond effluent and carbon footprint. Champion MSMEs completed environmental screening checklists, and the programme conducted a Strategic Environmental Assessment (SEA). Finally, the programme implemented activities to engage agri-tech and finance investors and innovators in a process to co-develop bankable business cases to replicate green aquaculture practices in the Ayeyarwady delta ecosystem.

1.2 Programme Implementation

The NGA Myanmar programme was led by Mercy Corps Netherlands and implemented in collaboration with Village Link, a technology company, and Daung Capital, a financial institution. The management of activities was carried out through close collaboration, planning, and making adaptive adjustments to meet the overall strategy, work plan, and technical approaches.

MCNL is responsible for overall coordination and implementation of the programme, donor liaison, and coordination with partners, contractors and other relevant actors/stakeholders. The MCNL team, comprising an aquaculture coordinator, Gender Equality and Social Inclusion (GESI) and program officer, and Monitoring, Evaluation and Learning (MEL) and Communication coordinator, led by the project team leader, ensures the smooth operation of the programme following the organisations and EC policies and activities were carefully implemented by the team strictly aligning them within scope, time, and budget. The MEL and Communication Coordinator is responsible for monitoring, evaluation, and learning, producing baseline, bi-annual reports, midterm reviews, and final evaluations. This person also coordinates with an external water quality and hydrology expert who conducts regular and periodic reports on water parameters. The Aquaculture Coordinator plays a key role in supporting technical training and on-the-ground support for champion MSMEs. The GESI expert ensures that Gender Equality and Social Inclusion (GESI), safety and security, as well as safeguarding and the Community Accountability Reporting Mechanism (CARM) are done properly. This central team also takes the leadership role to handle programme communications.

Village Link, is involved in two main areas in the programme; (1) facilitation of demonstrating Green Aquaculture Practices (GrAqPs) linking the Champion MSMEs with Microfinance Institutions (MFIs) and other Business, and (2) digitising the programme outputs and keeping the Champion MSMEs informed with technical supports and green aquaculture practices through Htwet Toe application. The Village Link team includes two field coordinators, each assigned to a specific township, and one senior aquaculture technical advisor. They conducted field day events at the demo ponds and facilitated the establishment of microfinance services, linkages, and other businesses with the champions.

Daung Capital, the financial institution, supports the programme by developing loan products aimed at promoting green finance for Champions MSMEs.

In addition, the programme included the involvement of private sector actors to provide technologies and solutions, such as those from other financial institutions and tech companies. For greater effectiveness, the NGA Myanmar programme engaged with the International Centre for Aquaculture and Fisheries Sustainability (ICAFIS) to gain industry-level knowledge from other countries. GrAqPs experts provided technical assistance to facilitate the more successful implementation of the programme.

This final evaluation document presents the results of the overall progress, achievements, and impact of the Nurturing Green Aquaculture in Myanmar (NGA Myanmar) programme, following a careful evaluation of its relevance, coherence, effectiveness, efficiency, impact, and sustainability. The document also demonstrates important lessons learned, recommendations and future potential programming.

2. Evaluation Methodology

2.1 Evaluation Objectives

The final evaluation aimed to assess the overall progress, achievements, and impact of the Nurturing Green Aquaculture in Myanmar, which was implemented from January 1, 2022, to June 30, 2025. The evaluation explored how the programme has effectively contributed to building increased environmental sustainability and resource efficiency in Myanmar's aquaculture sector. The evaluation scope specifically covered 1) measuring achievement against the project's outcomes and indicators' targets, 2) identifying best practices and challenges encountered, 3) assessing the sustainability, and 4) providing actionable recommendations for future programming. The project has collected project outcomes and indicator values through its bi-annual surveys, and the results were used to report to the programme indicators. Additionally, the values of these indicators, collected through the Final Evaluation, were used to triangulate and verify the findings. If there were any variations, the findings further discussed the perspective and reasons.

The evaluation team focused on capturing the perspectives of beneficiaries on the project's relevance, coherence, effectiveness, impact, and sustainability. The project's influence on beneficiaries' adoption of green technology and reduction of environmental degradation was evaluated through available technical data, surveys, Focus Group Discussions (FGDs) and in-person interviews (i.e., Key Informant Interviews (KIIs), In-depth Interviews (IDIs), and Most Significant Change (MSC) interviews).

The final evaluation focused on the aquaculture sector in the Yangon-Ayeyarwady aquaculture corridor, specifically in Twantay, Maubin, Pantanw, and Nyaungdon townships. The team designed a practical methodology to promote green practices and techniques to the target participants across 12 clusters.

2.2 Evaluation Design

The evaluation adopted a mixed-methods approach that integrated qualitative and quantitative data collection and analysis techniques. This approach ensured a comprehensive and nuanced understanding of NGA—Myanmar Programme achievements, processes, and challenges. The methodology was guided by the Scope of Work (SOW) and refined through consultations with the programme team and selected stakeholders to ensure alignment with contextual realities and expectations.

The evaluation questions were developed based on OECD DAC criteria but refined through a participatory process involving programme staff, technical specialists, and stakeholders. This process ensured that the questions reflected not only the consultants' technical framing but also the priorities identified by those directly engaged in programme implementation.

The evaluation began with an extensive desk review of relevant programme documents, including implementation reports, monitoring and evaluation data, baseline and midterm findings, bi-annual reports, and water quality parameters data. This review established a strong foundation for understanding the project's theory of change, implementation strategies, and key performance indicators.

Primary data collection combined surveys (focusing on required indicators), Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), in-depth interviews (IDIs), and direct field

observations. These methods were applied with champion MSMEs, the implementation team (project team, technicians, etc.), and relevant stakeholders. The methodology emphasised a participatory and inclusive approach, particularly ensuring that the voices of both women-led and men-led MSMEs were meaningfully represented.

The data analysis followed guided questions developed in line with OECD DAC criteria: relevance, coherence, effectiveness, impact, efficiency, and sustainability.

Evaluation Design

Method	Purpose	Target Groups
Desk Review	Review of programme documents, reports, M&E data, and progress indicators	Internal available project documents, e.g., baseline, Bi-Annual Surveys and midterm data.
Quantitative Survey	Collect measurable data on outcomes and impact across target groups	Champion MSMEs and cohorts (based on clusters/townships)
FGDs	Understand community perspectives, perceptions, and qualitative impact	Women-led and men-led MSMEs, along with cohort groups (four groups)
KIIs	Gather strategic insights from key stakeholders and project implementers	Project team, service providers, technicians, and, most significantly, changed champions
IDIs/FMC	Capture in-depth, personal narratives of key informants	Field staff, Community Facilitators
Most Significant Change	Validate the reported progress and assess the condition and usage of supported assets.	Demonstration ponds

Data Analysis Guided Questions

Area of assessment	Questions
Relevance	• How well was the programme design aligned with the needs and priorities of the target population and stakeholders? • How well were the programme objectives and activities relevant and responsive to the context? • To what extent does the programme address the identified problems or needs of its beneficiaries and stakeholders?
Coherence	• To what extent does the programme support Myanmar's transition to a low-carbon, resource-efficient and circular economy? • To what extent is the programme consistent with broader development goals, and does it complement or conflict with other interventions?
Effectiveness	• How well has the programme achieved its intended objectives? • How well have the outputs of the programme been achieved? And to what extent have they contributed to the programme objectives? • How effective are the approaches of the programme in delivering the desired outputs? How can they be improved?
Efficiency	• To what extent has the programme utilised the resources in relation to the outputs and outcomes achieved in terms of financial, human, and material? • Was there an effective process, built into the management structure, for self-monitoring and assessment, reporting and reflection? How well did this mechanism or process work?

Area of assessment	Questions
Impact	• To what extent has the programme contributed to the target population and stakeholders positively and negatively in terms of social, economic, environmental and other relevant dimensions? • Is the programme bringing about desired changes in the behaviour of people? If so, what is the extent of this change?
Sustainability	• To what extent are the programme's benefits, outcomes, and impacts likely to be sustained over time? • How well are all key stakeholders sufficiently and effectively involved? And how well are their expectations met, and are they satisfied with their level of participation? • Are alternative or additional measures needed, and if so, what is required to ensure continued sustainability and positive impact?

2.3 Sampling

The evaluation employed a purposive and random sampling approach to ensure representation across twelve clusters (defined as village-level groupings) within the three target townships. These clusters were identified in collaboration with the programme team to reflect geographical spread, diversity of market participation, and representation of both women-led and men-led MSMEs. Quantitative data were collected from 166 targeted respondents, including both male- and female-led MSMEs who had actively participated in programme activities.

The evaluation questions were developed based on the OECD DAC criteria but refined through a participatory process involving consultations with programme staff, technical specialists, and selected stakeholders. This ensured alignment with contextual realities and addressed priority areas identified jointly rather than solely by the consultants.

Quantitative data were targeted from 166 respondents[3], all of whom led MSMEs that had actively participated in programme activities. A total of 118 responses (M: 69 – 58%, F: 49 – 42%) were successfully collected by enumerators through in-person interviews and phone calls. The sex disaggregation is presented for descriptive purposes only and is not intended to represent the proportion of men and women in the total population, as no population weights were applied. The survey focused specifically on the following four indicators:

- % increase in incomes of champion MSMEs adopting both critical and desirable/non-critical green aquaculture practices and green tech
- % of champion MSMEs adopting both critical and desirable/non-critical greener aquaculture practices and green tech
- % of champion enterprises demonstrating satisfactory knowledge of green aquaculture concepts and practices
- # of MSMEs taking adaptive actions to reduce water pollution caused by aquaculture in response to water quality data and environmental screening checklists

[3] Sample calculated at 95% confidence level and 5% margin of error with the 10% additional respondents for non-responses. (N=248, n=151+15 (10%) =166), but only the enumerators team managed to collect 118 samples

Clarification on “clusters”: In this evaluation, “clusters” refer to the 12 village-level units located within the three townships of Maubin, Nyaungdon, and Twantay. A clustered sampling approach was applied, with respondents proportionately selected from each cluster to ensure coverage. The sampling design did not adjust for design effect, meaning sample precision may be subject to the common limitations of clustered sampling.

In addition to this evaluation-specific data collection, the programme had previously gathered similar information through biannual surveys, the results of which are used for formal programme indicator reporting. The most recent biannual survey, led by Mercy Corps, included 226 respondents (M: 186 – 82%, F: 40 – 18%) and was conducted by Field Monitoring Caseworkers (FMCs).

For the qualitative component, methods included Key Informant Interviews (KIIs) and Focus Group Discussions (FGDs), targeting a total of 131 participants. These included programme implementers, technicians, and champion MSMEs. The Most Significant Change (MSC) method, although originally mentioned, was not applied in its full, formal process; instead, qualitative validation of asset use was conducted through FGDs and in-depth site observations. Therefore, in this revision, MSC is not listed as a respondent type but rather acknowledged as an observational approach within FGDs.

A total of 20 FGDs were conducted, designed to capture diverse perspectives across gender, geographical clusters, and varying levels of project engagement. FGDs are described in terms of participants rather than “samples,” as they are qualitative group discussions rather than statistically sampled units.

Quantitative Surveys by township and gender

	Female	Male	Total
Maubin	18	30	48
Nyaungdon	19	30	49
Twantay	12	9	21
Total	49	69	118

Note: The three townships contain the twelve clusters from which respondents were proportionately drawn.

Quantitative Surveys by township and women-led/men-led MSMEs

	Men-led MSMEs	Women-led MSMEs	Total
Maubin	31	17	48
Nyaungdon	35	14	49
Twantay	9	12	21
Total	75	43	118

Qualitative Interviews

Respondent Type	Township/ Organisation	Participants	Methodology	Mode
Team Leader	Mercy Corps	1	KII	Online
MEL&C Coordinator	–	1	KII	Online
Aquaculture Coordinator	–	1	KII	Online
GESI and Program Officer	–	1	KII	Online
Project Manager (NGA)	Village Link	1	KII	In-person
Field Coordinator	–	1	KII	In-person
Technical Adviser	–	1	KII	Phone
Technical Adviser	ICAFIC	1	KII	Online
Technical Adviser	–	1	KII	Online

Respondent Type	Township/ Organisation	Participants	Methodology	Mode
Water Quality & Hydrology Consultant	–	1	KII	Online
Supervisor (Twantay)	LOLC Microfinance	1	KII	Phone
Field Monitoring Caseworkers	Mercy Corps	9	IDI/FMC	In-person
Men-led MSMEs	Champions from 12 clusters	10	FGD	In-person
Women-led MSMEs	Champions from 12 clusters	10	FGD	In-person
Observational Validation (Demo Ponds)	–	9	Asset/Observation	In-person

Qualitative Interviews with data gender disaggregation

Methodology	Male	Female	Total
KIIs	5	5	10
FGDs (Participants)	51	43	94
Observational Validation (Demo Ponds)	9	0	9
IDI/FMC	6	2	8
Total	71	50	121

2.4 Data Collection

Data collection was conducted by experienced consultants with thematic expertise in fisheries and agriculture research. These consultants undertook joint field visits to the project areas, coordinating and supervising all data collection activities.

Prior to field deployment, the team conducted online training sessions and preparatory meetings. These sessions covered the evaluation's objectives, data collection tools and methodologies, ethical considerations, and techniques for facilitating surveys, interviews, and focus group discussions.

In addition to primary data collectors, the evaluation team—particularly the Team Leader—provided critical support functions, including quality control, coordination, and troubleshooting. This involved daily debriefings, spot-checking survey responses, and providing real-time feedback to ensure consistency and accuracy in data collection. Ethical compliance was actively monitored, and guidance was provided to field teams to navigate challenges as they arose.

Data were collected using digital tools (Kobo Toolbox), which supported both online and offline functionality. All data were securely stored, regularly backed up, and handled in accordance with strict confidentiality protocols. Informed consent was obtained from all participants prior to any interviews or discussions, and a 'do no harm' approach was applied throughout the process.

2.5 Data Management and Analysis

A structured and secure data management plan guided all phases of the evaluation—from data collection to storage, processing, analysis, and interpretation. This plan ensured data quality, confidentiality, and credibility, enabling the generation of meaningful insights reflective of beneficiary and stakeholder experiences.

Quantitative data were primarily collected through Kobo Toolbox, a widely used digital platform suitable for remote and offline data collection. This tool minimized data entry errors, enabled real-time monitoring, and allowed for quicker processing of results.

Data cleaning was conducted in two stages: first, an initial review in Kobo Toolbox to identify outliers, incomplete records, or inconsistencies; and second, further cleaning and validation in Excel and SPSS. This included logical checks, handling of missing values, and incorporating feedback from enumerators and field notes.

Once cleaned, preliminary quantitative findings were produced using descriptive statistics, cross-tabulations, and frequency distributions. These findings were reviewed through internal team debriefs and shared with project stakeholders for initial feedback. Triangulation with qualitative data and secondary sources (e.g., project reports, baseline and midline evaluations) enhanced the validity and depth of the analysis.

Qualitative data—including transcripts and notes from Key Informant Interviews (KIIs), Focus Group Discussions (FGDs), and Most Significant Change (MSC) interviews—were recorded with consent and stored in a secure, clearly structured digital folder system for traceability.

Thematic analysis was applied to interpret the qualitative data. This involved reading transcripts, coding responses based on emerging patterns, and organizing codes into overarching themes aligned with the evaluation's objectives and guiding questions. Coding was done manually, accompanied by memos and reflective notes to preserve contextual nuances and evaluator insights.

Findings from the qualitative analysis were triangulated with quantitative data and secondary documents to ensure credibility. This multi-source triangulation helped uncover both convergences and divergences, leading to more nuanced and reliable conclusions.

2.6 Ethical Considerations

Strict ethical standards were upheld throughout all stages of the evaluation. Digital data were stored in secure, encrypted folders with restricted access. Personally identifiable information (PII) was anonymized or removed during data analysis and reporting to safeguard participant confidentiality. Informed consent was obtained from all participants, and all activities were guided by a commitment to ethical, respectful, and non-extractive engagement.

2.7 Limitations

The evaluation team faced several challenges during fieldwork, primarily due to the complex operational context. Below are the key limitations encountered, and the corresponding mitigation strategies applied:

- **Reluctance to Participate Due to Political Tensions**: Some respondents were hesitant to engage due to the prevailing political situation, expressing caution about interacting with strangers. To address this, interviews were scheduled in advance, with respected Field Monitoring Caseworkers (FMCs) and programme staff helping to facilitate introductions. This approach helped ease concerns and allowed interviews to proceed smoothly.
- **Sensitivity Around Legal Status of Fishpond Operations**: Respondents without formal documentation for their fishpond operations were cautious in answering questions. While this led to some guarded responses, enumerators were able to build trust and successfully gather the required information.

- **Seasonal Workload and Limited Availability**: Fieldwork coincided with a busy period for respondents involved in fishpond management and seasonal agricultural activities. The team adjusted the timing and location of interviews to accommodate respondent availability, ensuring coverage of the planned data collection sites.
- **Geographic Dispersion and Accessibility Challenges**: In cluster villages, respondents were geographically dispersed and faced transportation difficulties due to poor road conditions. The team addressed this by visiting multiple villages directly. Despite these efforts, the quantitative survey did not reach the targeted sample size of 168 respondents. The team attempted to bridge the gap through phone interviews, but some numbers were inactive, unavailable, or declined participation. As a result, only 118 respondents (M: 69, F: 49) were successfully surveyed. Smart enumerators adhered to ethical protocols throughout this process. To compensate for the shortfall, it was agreed with Mercy Corps that data from the most recent biannual survey would be used for the final evaluation—except for the indicator related to income increase, which relied on fresh data from this evaluation.
- **Restrictions Due to Military Activity**: In certain cluster villages, military recruitment activities created a tense environment that restricted movement and gatherings. The evaluation team adapted by conducting interviews in small groups and discreet settings, ensuring participant safety and comfort.
- **Limited Field Accompaniment by Programme Staff**: While fieldwork was arranged in coordination with respondents via phone, the absence of programme staff during some visits posed logistical challenges. Nonetheless, through mutual coordination and cooperation, the team was able to reach all target cluster locations.

3. Key findings

The final evaluation findings provide valuable insights into the impact and effectiveness of the NGA Myanmar programme on aquaculture beneficiaries within the Yangon–Ayeyarwady aquaculture corridor. The evaluation assessed multiple dimensions of the programme—namely, relevance, coherence, effectiveness, impact, efficiency, and sustainability—while also comparing programme targets with actual achievements. The findings highlight both successes and challenges, offering important lessons learned that can inform future programming. These insights serve as a foundation for practical recommendations, including the potential replication or scaling of the NGA Myanmar approach to further promote sustainable aquaculture practices across Myanmar.

3.1 Relevance

How well was the programme design aligned with the needs and priorities of the target population and stakeholders?

The NGA Myanmar programme was found to be highly relevant and well aligned with the needs, priorities, and expectations of the target population and stakeholders. Interview responses indicated that the programme's interventions directly addressed the practical needs of aquaculture MSMEs operating in the Yangon–Ayeyarwady aquaculture corridor. All respondents (100%) confirmed that the programme was relevant to their work and that the adoption of green aquaculture practices was beneficial to their operations.

This alignment reflects a participatory planning process, during which aquaculture MSMEs expressed a desire to adopt more sustainable and efficient practices. Once implemented, the programme significantly improved daily operations by providing practical knowledge on fish rearing—including feeding, water quality monitoring, green water management, and maintaining water clarity.

One respondent from the Ta Zin Yae Kyaw cluster stated, "***We know the traditional fish rearing method. When NGA Myanmar came, we learned much better techniques which are based on scientific principles***." The evaluation team concluded that the programme effectively addressed local needs by enhancing technical knowledge and improving fish survival rates and yields through better pond management.

For example, prior to the programme, eutrophication—excessive algae growth caused by nutrient buildup (primarily nitrogen and phosphorus)—was a major issue, especially in hatcheries where fish larvae were unable to consume algae. Farmers would frequently change water when algae built up. NGA Myanmar introduced water quality monitoring practices that helped prevent eutrophication. Respondents, particularly from Par Hleit, a women-led group, reported using lime and salt to manage algae growth, demonstrating the direct application of programme teachings. These practices helped reduce the need for frequent water changes and improved overall pond health.

How well were the programme objectives and activities relevant and responsive to the context?

The programme aims to support green aquaculture practices among producers, to reduce water pollution from their contaminated effluent. It has provided essential knowledge about green aquaculture practices and raised awareness levels. Field data shows that they have grasped the intention of the intervention. Although not all critical practices, such as activities related to water quality parameters and feeding methods, particularly measuring nitrate, nitrite, or phosphorus, are

followed by the participants, as they are highly technical. However, the interviews found that water temperature, pH, water quality and ammonia practices are paid more attention, showing high programme relevance. Furthermore, practices related to fishpond preparation were explored. Participants are now applying the correct amount of lime, fertiliser, and animal dung (cow dung) using the proper method, and they view these methods as very important.

Technical trainings, water testing, providing materials for water quality parameters, and eco-friendly methods were highly appreciated by the participants. These activities have made aquaculture MSMEs aware of resource efficiency and, to some extent, helped improve environmental degradation in the Myanmar aquaculture sector. The programme activities appear to have effectively responded to the project objectives. Likewise, demonstration ponds have been a place for participants to observe. Interviews revealed that demo ponds are relatively well set up, allowing for the observation of water quality control, the use of a solar pump, and the prevention of wild fish entering the ponds by using filtration nets in the water inlet area.

To what extent does the programme address the identified problems or needs of its beneficiaries and stakeholders?

Creating customised loan products tailored to MSMEs was a valuable initiative and was well received by participants. However, due to worsening macroeconomic conditions and systemic challenges facing financial institutions—such as difficulties in obtaining permits to operate in new areas—access to finance facilitated by the programme has not become widely available across all target locations.

In contrast, when discussing topics such as feeding practices, disease prevention, and fish survival management, respondents reported that the trainings enhanced their local knowledge and raised awareness about the importance of water quality monitoring. These green practices were found to be relevant and applicable to their fishpond operations.

While the concept of Feed Conversion Ratio (FCR) was introduced during the training to improve feeding efficiency, several respondents indicated challenges in fully applying it. The high fluctuation of feed prices limited their ability to consistently follow FCR-related practices (e.g., adjusting feed input), and many participants struggled with maintaining accurate feeding records. This made it difficult to assess actual improvements in FCR across the programme.

Feed prices have skyrocketed consistently throughout the project period (2022–2025), placing significant financial pressure on aquaculture producers. In response, the programme introduced an innovative solution: rearing black soldier fly (BSF) larvae as a sustainable protein replacement and a strategy to reduce feed costs. This initiative, which specifically targeted women-led MSMEs, was found to be both relevant and well adopted. Women champions demonstrated strong commitment to the practice, viewing it as a promising pathway to better economic returns.

Gender Equality and Social Inclusion (GESI) trainings were also well received. Key informant interviews (KIIs) indicated that such training was new to the project area. One respondent noted, "***It would be good to have a larger group, so that gender awareness can be created [for all]***." This suggests a strong demand for continued and expanded GESI awareness-raising efforts at the community level beyond the programme target participants.

As part of the programme's market campaign, onboarding training sessions were conducted, and champion MSMEs were successfully onboarded. The evaluation found that most had installed the Hwet Toe application on their phones and used it to call the hotline when facing fish disease issues. However, very few respondents reported using the service for loan-related inquiries, suggesting a gap in financial literacy. This indicates a need for additional financial education to increase the

uptake of such services. Despite this, the activity was found to be both relevant and sustainable, as champion MSMEs were able to find practical solutions to key challenges.

From private sector engagement, the field team identified key business actors such as agro-solar providers, water quality monitoring device suppliers, and feed machine suppliers—demonstrating the programme's role in facilitating valuable market linkages.

Overall, the programme's objectives and activities were found to be highly relevant, addressing critical issues such as water quality and fish survival. These efforts have contributed to improved environmental outcomes, particularly in reducing the risk of water pollution caused by effluent discharge from fishponds. By promoting aquaculture green techniques, the programme helped ensure that discharged water is of better quality, even when released into surrounding water bodies.

While the promoted practices are relevant and suitable for aquaculture businesses, respondents noted that broader macroeconomic and political challenges affected their ability to fully benefit from the interventions. As one respondent from the Htanee cluster stated, "***It is a bad time due to the distorted market and high prices; when everything is not normal, it is hard to do business***." This highlights that, although the programme design was strong, its success was constrained by external conditions—and that the impact could have been greater under more favorable circumstances.

3.2 Coherence

To what extent does the programme support Myanmar's transition to a low-carbon, resource-efficient and circular economy?

The NGA Myanmar programme is strongly coherent with the goals of the SWITCH-Asia initiative, which aims to support MSMEs in adopting cleaner, resource-efficient, and more sustainable production methods. By selecting the Yangon–Ayeyarwady aquaculture corridor—a region of ecological significance and economic importance—the programme aligns strategically with SWITCH-Asia's objectives.

Through the promotion of green aquaculture practices and technologies, the programme contributes to Myanmar's transition toward a low-carbon and circular economy. Technical support activities, such as training on sustainable feeding practices, water quality monitoring, and alternative protein sources (e.g., black soldier fly rearing), aim to improve resource efficiency and reduce the environmental footprint of aquaculture. These interventions also respond to critical issues such as water pollution, which is particularly relevant to the fragile Ayeyarwady delta ecosystem.

In this way, the programme demonstrates alignment with EU-funded policies supporting climate-smart agriculture and sustainable market systems in the region.

To what extent is the programme consistent with broader development goals, and does it complement or conflict with other interventions?

The programme is also aligned with Myanmar's **National Aquaculture Development Plan (NADP) 2019–2023,** which highlights the need for improved access to finance, adoption of good aquaculture practices, and technical support for small-scale aquaculture producers. NGA Myanmar directly responds to these gaps through its tailored interventions for MSMEs, including financial literacy, customized loan products, and technical capacity-building.

In addition, the programme contributes to the achievement of multiple Sustainable Development Goals (SDGs), notably:

- **SDG 5: Gender Equality** – through targeted support for women-led MSMEs and GESI training,
- **SDG 8: Decent Work and Economic Growth** – by enabling MSME productivity and sustainability,
- **SDG 12: Responsible Consumption and Production** – via promotion of resource-efficient practices,
- **SDG 13: Climate Action** – by fostering environmentally friendly fish farming systems, and
- **SDG 14: Life Below Water** – by helping reduce effluent discharge into water bodies.

The programme complements ongoing efforts by other actors in the sector, including financial institutions, technology providers, and local service delivery partners. Through these partnerships, NGA Myanmar facilitates access to critical resources and expertise for aquaculture MSMEs, enhancing their ability to adapt to environmental and socio-economic challenges.

This holistic and multi-stakeholder approach ensures strong coherence with donor priorities, national policies, and the broader sustainable development agenda.

3.3 Effectiveness

How effective are the approaches of the programme in delivering the desired outputs? How can they be improved?

At the outcome level, the NGA Myanmar programme focused on achieving one Specific Objective (SO): **"Aquaculture MSMEs adopt more resource-efficient and cleaner production practices."** To support this objective, the programme pursued five outcomes:

- **Outcome 1**: EUR 100,000 in commercial loans are channelled to kick-start the adoption of green technologies and practices by early adopter champion MSMEs.
- **Outcome 2:** Champion aquaculture MSMEs trial and demonstrate green aquaculture solutions across different geographic clusters.
- **Outcome 3:** 75% of target MSMEs in the Yangon–Ayeyarwady aquaculture corridor have knowledge and awareness to adopt green aquaculture solutions.
- **Outcome 4:** MSMEs take adaptive actions to reduce water pollution in response to environmental data generated by the programme.
- **Outcome 5:** Viable and bankable business cases for replicating the green aquaculture model are developed and promoted.

Based on a combination of quantitative data and interview findings, the evaluation concludes that the programme made meaningful progress toward these intended outcomes and objectives. The extent of this progress is reflected in the following key indicators.

The SO has two indicators. Under the indicator "***% of champion MSMEs adopting both critical and desirable/non-critical greener aquaculture practices and green technologies***," 68% adoption was recorded—slightly below the 75% target. A similar figure (65%) was reported in the final evaluation survey, showing only a minor variance of 3 percentage points. The evaluation team considered these results consistent and indicative of positive adoption trends.

Respondents widely reported applying critical green practices, particularly those related to water temperature, pH, clarity, and ammonia levels. Many also highlighted the importance of daily visual monitoring, such as assessing water colour and smell—practices that are culturally familiar and commonly used in traditional aquaculture.

More technical water quality parameters, such as nitrate and nitrite measurement, proved more challenging for some participants. As one respondent from the Maleto cluster explained, "***Some chemical measurement needs education to understand. I just finished basic education, and I do not understand it***." To address this, the programme engaged trained youth champions and Field Monitoring Caseworkers (FMCs) from local villages, who were trained by water quality experts. This model was designed to gradually build the capacity of MSMEs to understand and apply these practices independently.

While green aquaculture techniques were generally well received, many champion MSMEs continue to incorporate familiar traditional practices, such as visual observation, basic feeding routines, and preventive disease management. The concept of Feed Conversion Ratio (FCR) was introduced through training and through feed calculator of Htwet Toe app, and although some respondents are still becoming familiar with its practical application, it remains an area where further support would be beneficial. Some participants shared that adapting to FCR-based feeding approaches requires time and adjustment, highlighting an opportunity for ongoing guidance to help fully integrate this technique into their management practices.

Importantly, nearly all respondents reported improved fish survival rates since adopting water quality practices introduced by the programme—highlighting one of the most visible and appreciated outcomes. Variations in implementation were observed depending on pond size and location. In some smaller ponds located near paddy fields, effluent is often discharged into the fields, which farmers see as beneficial due to nutrient recycling. In contrast, MSMEs with larger ponds, particularly in areas without nearby agricultural land, often dry their ponds after three-year cycles instead of discharging effluent. The evaluation team noted that this practice may reduce environmental risk to nearby water bodies, illustrating context-specific adaptations of green practices.

Overall, the programme approaches have proven largely effective in delivering intended outputs, especially in enhancing knowledge, improving environmental awareness, and encouraging adoption of more sustainable aquaculture practices. With additional support focused on technical skill-building and reinforcing complex practices like FCR and water chemistry testing, the programme's effectiveness could be further strengthened.

SO: Target against achieved – two indicators

Indicator	Baseline	Target	Achieved (Bi-annual Survey)	Achieved (Final Evaluation)
% of champion MSMEs adopting both critical and desirable/non-critical greener aquaculture practices and green tech.	0	75%	68%	65%
% of other target MSMEs (cohort of 2,000 + cohort of 12,000) adopting only critical elements of green aquaculture	0	75%	91%	na

The second indicator under SO, which is "***% of other target MSMEs (cohort of 2,000 + cohort of 12,000) adopting only critical elements of green aquaculture***", achieved a strong 91% adoption rate, well above the 75% target. Qualitative interviews with several cohort members indicated that they follow similar water quality management practices as the champion MSMEs. Although these cohorts are not formally designated champions, many have learned green practices through peer learning from champions or by visiting demonstration ponds. Additionally,

field day events have contributed to increased adoption of green aquaculture practices among these groups, particularly in water quality control.

During field visits, the evaluation team observed growing interest among other fishpond owners in feed management practices such as using feed calculator to improve FCR. For example, new fish owners from the Ta Zin Yae Kyaw cluster proactively inquired about appropriate feeding amounts. Overall, the broader group of target MSMEs expressed appreciation for the knowledge and techniques shared through the programme, indicating successful knowledge transfer beyond the core champion group.

Under Outcome 1, the programme tracked one key indicator: "***# of target MSMEs accessing credit through newly developed customised loan products***". According to data provided by partnering financial institutions, a total of 1,595 programme participants accessed the green credit products, surpassing the target of 500. This represents a significant achievement given Myanmar's challenging macroeconomic environment. Despite the worsening economic situation, which created substantial barriers, the successful introduction and uptake of these new financial products by institutions for this sector is a noteworthy success.

In addition, in response to the challenging context, the programme supported selected participants through a discount scheme offering approximately 840,000 MMK to assist with the purchase of key technologies such as solar pumps and feed-making machines. This discount represented around 10–15% of the full price and, in most cases, enabled participants to use it as a down payment toward credit provided by collaborating technology suppliers.

Outcome 1 Target against achieved - one Indicator

Indicator	Baseline	Target	Achieved (Bi-annual Survey)
No. of target MSMEs accessing credit through newly developed customized loan products.	0	500	1,595

Outcome 2 is measured by two key indicators related to champion MSMEs' knowledge and business innovation in green aquaculture.

The first indicator, ***"% of champion enterprises demonstrating satisfactory knowledge of green aquaculture concepts and practices***," shows strong achievement. At baseline, only 63% of champions had satisfactory knowledge. The programme set a target of 75%, but the most recent bi-annual survey revealed that 98% of champion enterprises now demonstrate satisfactory knowledge. This substantial increase is supported by qualitative findings, where respondents consistently expressed sound understanding and satisfaction with the green aquaculture concepts and practices promoted by the programme.

The second indicator, "***Number of unique business cases for adopting green technologies and aquaculture at the pond level developed and promoted by champion MSMEs***," targeted the development and promotion of 10 business cases. This target was fully met, with 10 unique business cases successfully created and promoted by champion MSMEs This target was fully achieved, with 10 unique business cases successfully created and promoted by champion MSMEs.

One of the unique business cases developed and promoted by champion MSMEs is the adoption of solar pumps for aquaculture. This technology offers an energy-efficient alternative to conventional water pumps, reducing operational costs and environmental impact. Participants who have purchased and used solar pumps reported satisfaction with its performance, underscoring its

practical benefits and potential for wider replication. This case exemplifies how innovative green technologies can be successfully integrated into aquaculture practices, contributing to the programme's goals of promoting resource efficiency and sustainability.

Outcome 2 Target against achieved – two indicators

Indicator	Baseline	Target	Achieved (Bi-annual Survey)
% of champion enterprises demonstrating satisfactory knowledge of green aquaculture concepts and practices.	63 %	75 %	98 %
No. of unique business cases for adopting green tech & aquaculture at the pond-level developed and promoted by champion MSMEs.	0	10	10

Together, those indicators highlight the programme's effectiveness in increasing technical knowledge and fostering innovation among champion MSMEs in the aquaculture sector.

Outcome 3 aimed to improve knowledge and awareness of green aquaculture practices among broader cohorts of MSMEs, while promoting gender equality and social inclusion within aquaculture systems. Progress was tracked through four key indicators, all of which demonstrate meaningful achievements.

The first indicator, "***% of cohort of 12,000 target MSMEs who have increased knowledge and awareness to adopt green tech and green aquaculture practices***," began with a baseline of 0%, targeting 80%. The bi-annual survey shows that 83% of the cohort demonstrated increased knowledge and awareness, exceeding the programme target. This is a notable achievement. Although these cohort MSMEs are not formally designated as "champions," qualitative interviews revealed that many exhibit a level of knowledge comparable to champions—particularly in areas related to water quality management. Their understanding was built through exposure to demonstration ponds, learning from champion MSMEs, and participation in field day events. However, while awareness and knowledge have clearly improved, many respondents noted that full adoption of practices is still constrained by persistent challenges, such as high feed prices and market uncertainty.

The second indicator, ***"% of cohort of 2,000 target MSMEs who have increased knowledge and awareness to adopt green tech and green aquaculture practices***," also started from a 0% baseline and targeted 80%. The programme achieved a strong 94%, indicating deeper and more widespread uptake among this more intensively engaged group. Despite limited participation in interviews during fieldwork, those who were reached echoed similar experiences—gaining practical insights and exposure through learning exchanges and field-based activities, even though adoption remains partial for some due to contextual barriers.

The third indicator, ***"# of gender champions trained on household shared responsibilities and supported in disseminating it***," reports that 40 gender champions were trained and supported in delivering key gender awareness messages at the community level. Information, Education, and Communication (IEC) materials such as pamphlets were distributed during training sessions. While this initiative marked progress in integrating GESI, interviews revealed that there are still participants who did not perceive gender inequality as a challenge, despite clear male dominance in aquaculture operations. Nonetheless, GESI engagement in the programme was meaningful—gender champions and women GESI members took part in water quality monitoring alongside hydrology experts, contributing directly to technical implementation.

The fourth indicator, "***# of female entrepreneurs trained and supported in establishing or strengthening aquaculture businesses***," reached 274 women, demonstrating the programme's strong commitment to gender-inclusive growth. In addition to supporting women-led MSMEs in fish farming, the programme introduced fish value addition initiatives—such as fish sauce, fish paste, and dried fish production—paired with practical training. Interviews confirmed that women found these opportunities crucial and expressed strong interest in further market linkages and value chain integration to expand their income potential.

Overall, Outcome 3 shows strong performance in both knowledge dissemination and gender-inclusive support. While full adoption of practices is still influenced by economic constraints, the increased knowledge levels, active GESI participation, and growing engagement of women entrepreneurs mark significant progress toward building a more inclusive and sustainable aquaculture sector in the Yangon–Ayeyarwady corridor.

Outcome 3 Target against achieved – three indicators

Indicator	Baseline	Target	Achieved (Bi-annual Survey)
% of cohort of target 12,000 MSMEs who have increased knowledge and awareness to adopt green tech & green aquaculture practices.	0	80%	83%
% of cohort of 2,000 target MSMEs who have increased knowledge and awareness to adopt green tech & green aquaculture practices.		80%	94%
# of gender champions trained on household shared responsibilities and supported in disseminating it.	0	n/a	40
# of female entrepreneurs trained and supported in establishing or strengthening aquaculture businesses.	0	n/a	274

Outcome 4 aimed to encourage MSMEs to take adaptive actions to reduce water pollution, based on environmental data and tools introduced by the programme.

The indicator, ***"% of MSMEs that take adaptive actions to reduce water pollution caused by aquaculture, in response to data on water quality generated by the action and environmental screening checklists completed by champion MSMEs***," had a target of 50%. The programme achieved 99%, as reported through the bi-annual survey.

This high percentage reflects widespread uptake of at least one adaptive practice related to water quality—particularly among champion MSMEs, who were supported through regular technical guidance and tools. Many MSMEs adjusted their water pumping and effluent management practices based on awareness raised during trainings, field visits, and peer learning with demonstration ponds.

While the high figure signals strong programme influence, it's worth noting that the depth and consistency of adoption likely varied. Most MSMEs applied practical, low-cost actions such as monitoring water color, smell, pH, or ammonia levels, with support from trained youth champions and FMCs. These practices were seen as directly tied to fish survival and profitability, incentivizing their uptake.

Outcome 4 Target against achieved – one indicator

Indicator	Baseline	Target	Achieved
% of MSMEs that take adaptive actions to reduce water pollution caused by aquaculture, in response to data on	0	50%	99%

water quality generated by the action & environmental screening checklists completed by champion MSMEs			

Outcome 5 aimed to support the development and promotion of viable and bankable business cases that could enable wider replication of the green aquaculture model across the sector.

The indicator, "***Number of sector-wide bankable business cases for the expansion and replication of green aquaculture developed and promoted***," had a target of 3. This target was fully met, with 3 business cases developed and promoted.

As part of this effort, the programme facilitated connections between champion MSMEs and private sector actors—such as a solar energy company and a water quality test kit supplier—to support continued access to green technologies. These engagements aimed to establish market-based models that could operate beyond the life of the project.

The spread of green aquaculture practices among MSMEs indicates strong potential for continued adoption. However, interviews revealed that many champion MSMEs remain focused on maintaining their current operations and are cautious about making new investments beyond feed, largely due to ongoing economic uncertainties.

Overall, Outcome 5 has laid a foundational step toward wider sector engagement. Continued success will depend on future economic stability and sustained support from both private actors and financial institutions.

Outcome 5 Target against achieved – one indicator

Indicator	Baseline	Target	Achieved (Bi-annual surveys)
No. of sector-wide bankable business cases for the expansion & replication of green aquaculture developed & promoted	0	3	3

How well has the programme achieved its intended objectives? How well have the outputs of the programme been achieved? And to what extent have they contributed to the programme objectives?

The programme has made notable progress toward achieving its intended objectives. As detailed in the previous sections, green aquaculture practices and techniques were successfully introduced, with a particular emphasis on water quality monitoring. These practices were not only promoted but also reinforced through a well-structured support system.

The programme invested significantly in systematic monitoring, which played a critical role in ensuring the adoption and continuity of these practices. Field Monitoring Caseworkers (FMCs) were hired from local communities and conducted regular visits to support participants in applying recommended techniques. This hands-on engagement helped improve daily fishpond management, especially among Champion MSMEs.

As a result, water quality monitoring practices became more consistent and embedded in routine operations, contributing directly to improved fish survival rates and resource efficiency. These improvements reflect meaningful progress toward the programme's specific objective of promoting cleaner and more sustainable aquaculture practices.

The evaluation team found that this ongoing technical support and follow-up were instrumental in converting training into practice, ultimately strengthening both the delivery of programme outputs and the achievement of long-term objectives. (See Efficiency section for further detail.)

3.4 Efficiency

To what extent has the programme utilised the resources in relation to the outputs and outcomes achieved in terms of financial, human, and material resources? Was there an effective process, built into the management structure for self-monitoring and assessment, reporting and reflection? How well did this mechanism or process work?

The programme effectively utilised its financial, human, and material resources to deliver the planned outputs and achieve its intended outcomes. Activities were implemented with close alignment to the programme goals and outcome areas, supported by a coherent management structure.

Mercy Corps, as the lead implementing partner, provided strategic oversight, ensuring that implementation adhered to both programme design and donor requirements. Its partnership with Village Link, a Myanmar-based digital service provider, allowed for efficient field-level delivery. Village Link played a key role in engaging aquaculture MSMEs, connecting them with green aquaculture experts, technology providers, and agri-related services through the Htwet Toe mobile application. The app also served as an information and communication platform for MSMEs throughout the project.

Village Link's role extended beyond technology promotion and field activities—it facilitated financial linkages, supported GESI initiatives, and arranged women's empowerment training. The programme also facilitated technical assistance from Vietnamese aquaculture experts, which enabled target participants to explore innovative, resource-efficient aquaculture practices and gain practical insights.

The programme invested in a compact and efficient staffing structure. Both Mercy Corps and Village Link employed qualified aquaculture experts who were accessible to participants via regular visits, phone calls, Viber groups, and the mobile app. This continuous technical support proved essential in strengthening the application of green aquaculture techniques at pond level.

A particularly notable aspect of the programme's operational efficiency was its monitoring mechanism. The programme engaged youth from among the GESI champions to support water quality experts in conducting regular pond water assessments and providing timely feedback to participants. In parallel, Field Monitoring Caseworkers (FMCs) were hired to conduct routine visits, monitor knowledge and practice adoption, and serve as a key link between participants and the programme team. This dual approach proved to be both effective and resource-efficient, facilitating real-time feedback loops and enabling adaptive management throughout implementation.

Communication and coordination among staff were streamlined using common tools such as mobile phones and messaging apps. The evaluation team found that the programme's structure and management systems enabled effective self-monitoring, regular reflection, and adaptive implementation—contributing to high output delivery relative to resources used.

In addition, to support the analysis of efficiency, the evaluation team assessed the output-level indicators to determine whether the programme delivered its planned activities and services in a timely and cost-effective manner, and whether these outputs contributed meaningfully to the achievement of outcomes.

Output 1.1 targeted at loan products developed & a marketing campaign delivered to promote green tech and green aquaculture financing. During the programme, the target was to develop 2 customised loan/credit products, but the programme successfully facilitated the development and availability of 4 such products. This is a notable achievement considering Myanmar's ongoing

challenging economic environment, marked by market uncertainty and regulatory constraints that affect both MSMEs and financial institutions.

Focus group discussions indicated that while financial institutions introduced their loan products, uptake among aquaculture MSMEs has been cautious. Many MSMEs operate on an annual income cycle and are naturally prudent about taking on debt amidst fluctuating market conditions. Despite efforts by financial institutions to offer lower interest rates, more flexible payment terms, and fewer requirements compared to other loan products, many participants still perceived borrowing as challenging. Concerns remain around interest rates and the legal documentation required by financial institutions, which continue to pose barriers for some. Some women participants expressed a strong interest in accessing loans to grow their businesses, though access remains limited due to operational restrictions on microfinance services in certain township areas.

This reflects the complex interplay of economic uncertainty, regulatory limitations, and evolving risk-taking and risk-aversion attitudes within the sector. Nevertheless, the programme has successfully facilitated the development and introduction of tailored green financing options, laying a strong foundation for improved access to finance and sustainable growth among aquaculture MSMEs.

The marketing campaign significantly exceeded expectations by reaching 16,336 MSME owners and operators, more than double the target of 7,125. The Htwet Toe mobile application, installed on many users' phones, provided a platform to connect MSMEs with microfinance services. While some respondents reported limited current use of these services, this reflects the early stage of digital financial service adoption among aquaculture MSMEs. The evaluation team sees this as an opportunity: with ongoing financial education and increased awareness, uptake is likely to improve, especially as many MSMEs identified loans as essential for managing feed costs.

Output 1.1 Target against achieved – two indicators

Indicator	Baseline	Target	Achieved (Bi-annual Survey)
No. of customised loan/credit products developed & available for aquaculture MSMEs (250 champion, others MSMEs 2000+12000).	0	2	4
Number of MSME owners & operators reached with the marketing campaign.	0	7,125	16,336

Output 2.1 targeted demonstrations of green technology and green aquaculture practices delivered to champion MSMEs with active participation from the private sector. Under this output, the programme successfully implemented 13 demonstration ponds, exceeding the target of 12. Additionally, 299 champion enterprises participated in demonstration field day events on green aquaculture practices, surpassing the target of 250. A total of 18 private sector input and technology vendors participated in activities at the demonstration ponds alongside the target MSMEs, significantly exceeding the target of 5.

These achievements demonstrate the programme's effective dissemination of green aquaculture practices in real-world settings at the demonstration pond sites. Initially, the demo ponds were conceptualized as farmer field schools, but faced challenges such as logistical constraints and difficulties in organizing regular gatherings. Given the sensitive political context where large crowds pose risks, these gatherings required careful management. Nevertheless, within the capacities and

opportunities available, the demo ponds effectively showcased green aquaculture practices, enabling both champions and cohort MSMEs to observe and learn directly.

Focus group discussions revealed positive feedback from champion MSMEs, who valued and appreciated the demonstration approach. Private sector participants, such as technology companies specializing in solar pumps, fish feed machines, smart feeding using Internet of Thing (IoT) are among others, further strengthening the linkages between MSMEs and innovative aquaculture technologies.

Output 2.1 Target against achieved – three indicators

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
Number of demos organised.	0	12	13
Number of champion enterprises participating in demos on green aquaculture practices.	0	250	299
Number of private sector input and tech vendors participating in demos alongside target MSMEs	0	5	18

Output 2.2 targeted champion enterprises to receive follow-up technical support and foster collaboration with private technology, input, and service providers to demonstrate green aquaculture practices to peer MSMEs within the cohort of 2,000. By the end of the programme, 299 champion MSMEs participated in follow-up technical interactions and workshops, exceeding the target of 200.

As part of ongoing support, technical companies remain accessible through the village network and the Htwet Toe mobile application. Respondents reported actively seeking advice on fish disease issues and following guidance from aquaculture experts. They also retain direct contact information for providers of different technologies, like IoT systems, solar pumps, etc.

Output 2.2 Target against achieved – one indicator

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
No. of champion MSMEs participating in follow-up technical interactions & workshops.	0	200	299

Output 3.1 aimed to engage target MSMEs from the cohort of 2,000 (i.e., those categorized as Early Adopters) in field day events and demonstrations on green technologies and aquaculture practices at sites run by champion MSMEs. By the end of the programme, a total of 2,062 target participants participated in these learning events, exceeding the target of 2,000.

During the evaluation fieldwork, some Early Adopter participants also took part in interviews and shared that they were familiar with green aquaculture practices—suggesting that the demonstration-based learning approach was effective in transferring knowledge to a wider group.

As part of this output, 27,226 users were onboarded to the Htwet Toe digital app and Facebook group—far exceeding the target of 10,688. This highlights the programme's efficiency in reaching a wider audience by leveraging digital platforms to disseminate information. However, field findings revealed generational differences in digital engagement: younger users actively used the app, while older participants preferred direct communication methods such as phone calls or in-person consultations.

Output 3.1 Target against achieved – one indicator

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
No. of target MSMEs from cohort of 2,000 that participate in learning events & demos on green aquaculture practices at independently run demo sites (75% of 2,000).	0	2,000	2,062
No. of target MSMEs onboarded to and actively using aquaculture-specific functions of the Htwet Toe digital app and Facebook Group. (75% of 14,250)	0	10,688	27,226

Output 4.1 focused on generating data related to pond effluent water quality, carbon footprint of aquaculture operations, and their potential environmental impact on the Ayeyarwady Delta ecosystem. The programme made significant progress under this output, exceeding most of its targets:

- 26 water quality monitoring reports were produced, more than doubling the target of 11.
- carbon footprint estimates were conducted among champion MSMEs, exceeding the original target of 3.
- 426 environmental screening checklists were completed by champion MSMEs, surpassing the target of 375.
- 1 environmental impact study was conducted, meeting the set target.

These achievements reflect the programme's strong focus on environmental sustainability and its commitment to generating actionable data. Through these efforts, the programme has contributed to promoting environmentally responsible aquaculture practices and supporting broader goals to reduce degradation of the Ayeyarwady Delta ecosystem.

Output 4.1 Target against achieved – four indicators

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
No. of water quality monitoring reports from the action available (if possible, online) and their quality.	0	11	26
No. of estimates of the carbon footprint of champion MSMEs.	0	3	4
No. of environmental screening checklists completed by champion MSMEs.	0	375	426
No. of environmental impact studies available and its quality.	0	1	1

Private sector engagement forms the backbone of NGA-Myanmar. The programme was intentionally designed to foster market-based solutions that could sustain beyond its lifetime. Two lead partners—Village Link, a digital agri-tech firm, and Daung Capital, a financial services provider—are both private sector actors that will continue to operate and scale their services post-programme. Beyond these core collaborators, NGA-Myanmar strategically engaged a wider network of private sector actors across the aquaculture value chain.

Output 5.1 aimed to engage agri-tech and finance innovators and investors in co-developing bankable business cases to replicate green aquaculture practices. The programme exceeded its target by engaging at least seven private sector actors through structured co-development interactions. These collaborations included Agros Global and SCT Power Solar Myanmar (solar-

powered pump systems), Space and Universe (feed-making machines), Dana Hlaing (quality fish seed supplier), Tepbac (IoT water sensors), and financial service providers LOLC Myanmar and Vision Fund. These partnerships contributed to field demonstrations, piloting of tailored loan products, and improved access to green technologies for aquaculture MSMEs. Additionally, the programme forged collaborations with A Bank and Maha, both of which supported financial literacy training and explored loan offerings for rural aquaculture producers—particularly women-led enterprises. Towards the end of the programme, three bankable business cases were documented and presented to a range of private sector actors during a seminar held in Yangon. The seminar served as a platform to share lessons learned, promote replication, and encourage continued investment in green aquaculture practices.

While formalised partnerships were originally envisioned, the programme wisely adapted to Myanmar's volatile economic and political context by adopting a flexible, trust-based engagement model. This approach enabled responsive and pragmatic collaboration tailored to each partner's priorities and capacities. As a result, NGA-Myanmar successfully positioned both technology and finance actors to continue supporting the expansion of green aquaculture—laying a strong foundation for sustainability and sector-wide replication beyond the life of the programme.

Output 5.1 Target against achieved – one indicator

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
No. of creative co-development interactions and webinars organized with investors and innovators.	0	6	7

The evaluation adopted a mixed-methods approach that integrated qualitative and quantitative data collection and analysis techniques. This approach ensured a comprehensive and nuanced understanding of NGA—Myanmar Programme achievements, processes, and challenges. The methodology was guided by the Scope of Work (SOW) and refined through consultations with the programme team and selected stakeholders to ensure alignment with contextual realities and expectations.

The evaluation questions were developed based on OECD DAC criteria but refined through a participatory process involving programme staff, technical specialists, and stakeholders. This process ensured that the questions reflected not only the consultants' technical framing but also the priorities identified by those directly engaged in programme implementation.

The evaluation began with an extensive desk review of relevant programme documents, including implementation reports, monitoring and evaluation data, baseline and midterm findings, bi-annual reports, and water quality parameters data. This review established a strong foundation for understanding the project's theory of change, implementation strategies, and key performance indicators.

Primary data collection combined surveys (focusing on required indicators), Focus Group Discussions (FGDs), Key Informant Interviews (KIIs), in-depth interviews (IDIs), and direct field observations. These methods were applied with champion MSMEs, the implementation team (project team, technicians, etc.), and relevant stakeholders. The methodology emphasised a participatory and inclusive approach, particularly ensuring that the voices of both women-led and men-led MSMEs were meaningfully represented.

The data analysis followed guided questions developed in line with OECD DAC criteria: relevance, coherence, effectiveness, impact, efficiency, and sustainability.

To what extent has the programme contributed to the target population and stakeholders in positively and negatively in term of social, economic, environmental and other relevant dimensions?

The primary objective of the programme was to enhance resource efficiency and reduce environmental degradation in Myanmar's aquaculture sector, while supporting improved economic returns across the value chain. The programme was thoughtfully designed to promote these goals despite the challenging and volatile economic and political context in Myanmar. Given the ongoing inflation and market uncertainties, expecting consistent income growth is difficult, as investment in new technologies—such as water monitoring kits, IoT devices, solar pumps, and feed pellet machines—remains cautious among champion MSMEs.

Nonetheless, the programme has generated significant positive impacts, particularly in areas like water quality management, feed conversion efficiency, natural feed alternatives, pond preparation, and disease prevention. These improvements have contributed to better environmental outcomes, especially in reducing water pollution. Champion MSMEs have demonstrated clear understanding and adoption of critical green aquaculture practices, recognizing their direct link to fish survival and income stability. The availability of direct expert support through phone, messaging apps, and the Htwet Toe platform has been well received, though MSMEs still prefer personal assistance, highlighting the importance of continuous engagement.

Unexpectedly, strong networking and peer-to-peer learning among champion MSMEs within clusters have flourished, particularly through information exchange at demonstration ponds. Some respondents shared that green aquaculture practices helped them overcome challenges posed by feed price fluctuations and water-related fish mortality. This reflects a meaningful behaviour change where water quality control is now prioritized due to its direct effect on fish survival and revenue.

Is the programme bringing about desired changes in the behaviour of people? If so, what is the extent of this change?

The programme has successfully encouraged positive behaviour changes, especially regarding water quality management. Champion MSMEs now consistently emphasizes the importance of maintaining good water quality, understanding that poor water conditions negatively impact fish survival. This focus on critical practices reflects the programme's impact on fostering practical and relevant knowledge uptake.

Regarding feed conversion ratio (FCR), quantitative data indicate that 85% of champion MSMEs reported a reduction of 0.2 points or more, exceeding the target of 75%. However, field feedback suggests that precise adherence to FCR remains a work in progress due to market unpredictability. Nevertheless, participants indicated improvements in feeding practices despite not fully following exact FCR guidelines. This reflects growing awareness and gradual behavioural change, even as market uncertainties and other challenges continue to affect the sector.

Objective-level indicator

Indicator	Baseline	Target	Achieved (Bi-Annual survey)
% of champion MSMEs reducing feed conversion ratio (FCR) by 0.2 points or more.	3.6	75%	85%

Regarding wastewater effluent parameters—such as reductions in nitrogen, phosphorus, and biochemical oxygen demand, along with increased dissolved oxygen—quantitative data show that 90% of champion MSMEs achieved improvements, surpassing the target of 75%. Interviews revealed that champion MSMEs are satisfied with the improved water quality. It was also noted that smaller pond owners often discharge treated effluent into agricultural fields, effectively recycling bio-nutrients beneficial for crops. Meanwhile, larger pond operators periodically dry their ponds, also a cost-effective and environmentally considerate practice.

Objective-level indicator

Indicator	Baseline	Target	Achieved (Bi-Annual survey
% of champion MSMEs with improved wastewater effluent parameters (reduced nitrogen, phosphorus and biochemical oxygen demand and increased dissolved oxygen)	0.42	75%	90%

One measurable environmental improvement is the reduction of CO2 emissions from the aquaculture operations of champion MSMEs. Quantitative survey results indicate a 42% reduction in CO2 emissions, exceeding the target of 25%. Technical calculations were conducted by water experts to determine the precise reduction. Meanwhile, field observations by the evaluation team found no signs of pollution, contamination, or any negative environmental impact during the evaluation.

Objective-level indicator

Indicator	Baseline	Target	Achieved (Bi-Annual Survey)
% reduction in estimated CO2 emissions from champion MSMEs' aquaculture operations.	3.75	25%	42%

The final evaluation also measured its impact through increases in income among champion MSMEs. At baseline, average income was 1,296,330 MMK per acre (approximately 1,524.73 USD per hectare), with a target to increase this by 20% by the end of the project. According to the final survey results, incomes increased by 57%, reaching 2,260,451 MMK per acre (approximately 2,659.85 USD per hectare). This significant growth is attributed to the adoption of improved practices such as proper pond preparation, optimized feeding, careful fingerling handling, effective water quality management, promoting green water development, timely interventions against water contamination, and higher survival rates, all of which contributed to larger and healthier fish.

Objective-level indicator

Indicator	Baseline	Target	Achieved (Final Evaluation)
% increase in incomes of champion MSMEs adopting both critical and desirable/non-critical green aquaculture practices and green tech.	1,296,330 MMK/ac (1524.73 USD/ha)	20%	57%[4] 2,260,451 MMK / ac (2,659.85 USD/ha)

3.5 Sustainability

To what extent are the programme's benefits, outcomes, and impacts likely to be sustained over time?

The programme has successfully raised awareness of green aquaculture practices and technologies among target participants in the Yangon–Ayeyarwady aquaculture corridor. These participants have gained a considerable level of knowledge regarding the efficient use of resources and the reduction of environmental degradation, including through the management of water quality and other green practices.

Interviews indicated that aquaculture MSMEs are likely to continue applying the promoted practices, such as water quality monitoring, correct pond preparation methods (e.g., by using lime and natural fertilisers), proper feeding management, integrated pest and disease management, etc. These practices are now well understood as being beneficial for improving the safety, productivity, and profitability of their operations.

One notable green technology promoted by the programme is the use of solar pumps. Many aquaculture MSMEs interviewed expressed a strong interest in investing in this technology, recognizing its role in supporting water quality management through efficient water exchange. The evaluation team observed successful adoption at a hatchery fish farm in Par Hleit village, Nyaungdon township, where the technology is already delivering positive results. Given its practical benefits and growing interest among farmers, the scalability of solar pumps within the aquaculture sector appears highly promising.

FCR practices are also expected to be adopted over the long term, particularly as feed and market prices stabilize. Interviews reveal that aquaculture MSMEs are generally familiar with the concept of FCR and can clearly recognize its link to efficiency and productivity. However, there remains room to deepen their understanding of how FCR connects with water quality and, in turn, how it influences wastewater pollution. With continued support—especially through practical demonstration ponds—these knowledge gaps can be effectively addressed. Such efforts could gradually shift traditional feeding practices toward more systematic, environmentally responsible management.

[4] *2,260,451 MMK / ac (2,659.85 USD/ha)*

The adoption of feed pellet-making machines is showing encouraging progress. During fieldwork, the evaluation team observed that the technology is already in use among some aquaculture MSMEs. While a few farmers are still in the process of fully distinguishing the benefits of pelleted feed from traditional methods, the overall response has been receptive. With continued peer-to-peer, practical demonstrations—particularly when combined with FCR practices—there is strong potential for wider acceptance and successful integration into existing farming systems, offering both efficiency gains and improved feed management.

The Black Soldier Fly (BSF) initiative also shows strong prospects for sustainability. This practice is not only valuable for fish farming but is also seen as highly beneficial for other livestock such as ducks and chickens. Even in cases where BSF is not used directly for fish feed, it offers a profitable opportunity for livestock feeding. The initiative is currently led by a women's group, who expressed confidence in continuing this activity beyond the life of the programme.

The introduction of smart feeding with IoT solutions has brought a new level of technical advancement to aquaculture practices. Through internet-enabled monitoring, producers can manage water quality more efficiently and with greater ease, which has been well received by aquaculture MSMEs who view these tools as both convenient and innovative. While current adoption may be more feasible for medium to large operators due to higher costs and technical requirements, the technology holds strong future potential. As digital tools become more affordable and accessible, IoT solutions are likely to become increasingly relevant for a broader range of aquaculture enterprises.

Looking ahead, many of the promoted practices and technologies are well-positioned for continued support through Village Link—a digital company that remains active in the programme areas and beyond. Its ongoing presence will play a key role in sustaining access to technical products, services, and advisory support. In addition to promoting green technologies, Village Link is also exploring opportunities to link aquaculture MSMEs with green finance solutions, which can further incentivize the adoption of sustainable practices. This continuity not only reinforces the uptake of green aquaculture innovations but also strengthens the programme's longer-term impact by ensuring that MSMEs remain connected to both technological advancements and financial mechanisms that support environmental sustainability.

How well are all key stakeholders sufficiently and effectively involved? And how well are their expectations met and are they satisfied with their level of participation?

The programme's tiered approach to participant engagement—from Champion MSMEs (250) to Early Adopters (a cohort of 2,000), and eventually to the Early Majority (a broader cohort of 20,000)—proved highly effective in fostering active participation and unlocking economies of scale. This structure not only strengthened peer learning and diffusion of innovation but also created stronger incentives for private sector actors to expand their provision of green services, technologies, and financing. During training sessions and demonstration activities, participants engaged enthusiastically and expressed satisfaction with the introduced technologies—particularly water quality monitoring tools and solar pumping systems. Interviews consistently confirmed that participants had developed a solid understanding of green aquaculture practices, further reinforcing the effectiveness and value of the programme's inclusive engagement model.

Are alternative or additional measures needed and, if so, what is required to ensure continued sustainability and positive impact?

Overall, the evaluation did not identify a strong need for alternative activities. Access to financial services presents a valuable opportunity to further strengthen the impact and sustainability of the programme. With tailored financial education and proactive outreach, loan service providers can build stronger relationships and trust with champion MSMEs. Encouragingly, several MSMEs

indicated a willingness to consider financing options when they have a clearer understanding of opportunity costs and potential returns. As economic conditions improve and financial literacy deepens, the uptake of loans to support green investments is likely to grow, unlocking new opportunities for business expansion and sustainability.

Additionally, Mercy Corps has launched another programme—Sein-Lan Myanmar—that promotes circular economy principles within the animal feed value chain. Although this initiative covers a broader range of animal feeds and is not exclusively focused on fish feed, its emphasis on environment-friendly approach aligns well with the green aquaculture practices introduced under NGA Myanmar. While the connection between the two programmes is less direct, there is meaningful potential for positive synergy, with Sein-Lan Myanmar helping to strengthen and reinforce sustainable feed innovations promoted by NGA Myanmar.

In conclusion, a large portion of the programme's benefits are likely to be sustained, given their clear links to income generation and business performance. The programme interventions have been both practical and relevant, offering long-term value to target participants.

3.6 Cross-cutting

Gender Equality and Social Inclusion (GESI) interventions played a vital role in promoting the inclusion of spouses and youth in trainings, demonstrations, and other programme activities. While local perceptions indicated minimal gender discrimination, the aquaculture is in general a male-dominated sector. Notably, among the 20 FGDs conducted, half included female participants who demonstrated meaningful aquaculture knowledge. This suggests that many women either participated directly in the programme's capacity-building activities or, at minimum, benefit from knowledge shared within households.

From the outset, the programme integrated a comprehensive GESI analysis to ensure that inclusivity remained a core principle throughout implementation.

GESI trainings successfully enhanced participants' understanding of gender equality and encouraged women to take on more leadership roles within their communities. Participation across activities was gender-sensitive and inclusive, with no reported incidents of harm or exclusion affecting either male or female MSMEs.

Regarding women's economic empowerment, financial management training delivered in partnership with A Bank, alongside value-added product sessions such as fish paste and dried fish processing, opened new economic opportunities for women. Interviews confirmed active female engagement and enthusiasm for these opportunities. Women's FGDs highlighted that facilitating market linkages to premium markets would further strengthen their economic advancement.

While these women economic empowerment-focused activities were well-designed and positively contributed to women's development, the evaluation team observed that they had a somewhat less direct relationship with the programme's core objectives—particularly those centered on environmental stewardship. Nonetheless, these activities provide a valuable complement to the programme's broader goals of inclusive economic growth and community resilience.

4. Conclusions

The final evaluation findings indicate that NGA Myanmar has made a positive and meaningful impact on the targeted aquaculture MSMEs. Critical green aquaculture practices were well understood by participants, and interviews confirm that MSMEs intend to continue applying these methods in the future. As these practices are adopted, water quality is expected to improve, contributing gradually to better environmental conditions.

Relevance: The NGA Myanmar programme was well aligned with the needs of aquaculture MSMEs within the Yangon-Ayeyarwady aquaculture corridor. The findings highlight the programme's high relevance. Its overall design was thoughtfully developed, integrating private sector engagement to provide both technologies and financial support. This approach contributed significantly to the achievement of the programme's objectives and outcomes. Additionally, the inclusion of Gender Equality and Social Inclusion (GESI) components was highly effective and widely appreciated, fostering vibrant and inclusive participation.

Coherence: The programme was implemented in alignment with several key frameworks, including Sustainable Consumption and Production (SCP), circular economy principles, the National Aquaculture Development Plan (2019–2023), and the Sustainable Development Goals (SDGs). This alignment demonstrates strong coherence with both national and international development priorities.

Effectiveness: The programme demonstrated high effectiveness, particularly through showcasing green practices and technologies at demonstration ponds. It successfully built trust in NGA's aquaculture education initiatives among MSMEs and facilitated technology sharing within the broader local aquaculture community, including farmers who did not directly participate.

Efficiency: The programme operated efficiently, as evidenced by a robust monitoring mechanism for water quality and environmental indicators, with biannual reporting. Activities were implemented with strong commitment and timeliness. Events such as field days engaged a wide number of MSMEs in the project area. Coordination with technical companies, loan and credit service providers, and delivery of GESI trainings were all executed with excellent planning and organization.

Impact: The programme has generated positive impacts on MSMEs in adopting green aquaculture practices. Several significant improvements were noted, including enhanced water quality control, better feed conversion ratios, use of natural feed alternatives, improved pond preparation techniques, and disease prevention. Collectively, these have contributed to gradual improvements in environmental conditions, particularly reductions in water pollution.

Sustainability: The programme successfully raised awareness and knowledge of green aquaculture practices and technologies among champion MSMEs and their wider networks. These participants have developed a strong understanding of efficient resource use and the importance of controlling water quality and effluent discharge. According to qualitative interviews, essential practices such as water quality control are expected to be sustained.

Innovative technologies introduced through the programme—such as internet-based water quality monitoring systems and automation via IoT—have been widely recognized by participants for their potential to transform aquaculture management. While adoption of these technologies is still in the early stages, largely due to cost and technical considerations, their demonstrated benefits have sparked strong interest among champion MSMEs. These tools are laying the foundation for more data-driven, efficient, and environmentally sustainable practices in the future.

The Black Soldier Fly (BSF) initiative, introduced as an alternative protein source, continues to gain traction beyond aquaculture, with practical applications in duck and poultry farming. Its low-cost, nutrient-rich profile has made it a promising innovation that supports circular economy principles and helps reduce feed costs—one of the most significant challenges faced by small-scale producers.

Through Village Link's active facilitation, robust connections have been built between champion MSMEs and technical companies. These producers, having seen the tangible benefits of green aquaculture practices, are committed to maintaining and expanding their use of environmentally sound techniques. With Village Link continuing its support via the Htwet Toe digital platform, MSMEs will retain access to tailored technical solutions, peer learning, and product suppliers. This strong digital and business infrastructure ensures that the programme's positive impact will be sustained and scaled well beyond its implementation period.

5. Lessons learned and Recommendations

This section highlights key lessons drawn from the programme's implementation and evaluation findings, along with forward-looking recommendations. These reflections are intended to inform future green aquaculture programming and contribute to more inclusive, efficient, and sustainable market-based approaches.

5.1 Key Lessons learned

Feed Conversion Ratio (FCR): The programme successfully introduced the concept of FCR, and most participants demonstrated a good grasp of its value, incorporating FCR practices to varying degrees. Participants recognized its role in improving feeding efficiency and enhancing fish growth. However, a few misconceptions surfaced during interviews—for example, the belief that applying FCR would require higher feed quantities, making it unaffordable. As one participant shared, "***Only big ponds can follow it***." These insights point to a valuable opportunity to deepen technical coaching, with a focus on clarifying that FCR is a tool for optimizing feed use—not increasing it. Strengthening this understanding will help further reduce input costs and support sustainable aquaculture practices.

Access to Financial Services: The programme made meaningful progress in expanding access to financial services for aquaculture MSMEs through strategic partnerships, digital tools such as the Htwet Toe platform, and targeted in-person outreach. These efforts laid strong foundations for financial inclusion and supported the availability of green finance to help MSMEs adopt sustainable aquaculture practices and technologies. While uptake of loan products remained modest, this reflected the cautious but rational approach of producers navigating a volatile economic environment. At the same time, it highlighted a valuable opportunity to further strengthen financial literacy—particularly around loan terms, repayment schedules, and the strategic use of credit to enhance business resilience and growth.

Importantly, the programme generated critical insights into the aquaculture sector's financing needs, especially the requirement for products aligned with aquaculture's longer production cycles and seasonal cash flows. Financial institutions showed clear interest in supporting the sector and began developing products to enable greener aquaculture practices. However, structural barriers—such as regulatory constraints and limited geographic coverage—continue to present operational challenges. Nonetheless, the growing willingness of financial actors to engage, coupled with rising awareness among MSMEs, presents a strong platform for the future development of tailored, inclusive, and aquaculture-sensitive financial solutions.

Demonstration Ponds and Outcome Tracking: Demonstration ponds served as an essential platform for peer-to-peer learning, enabling Champion MSMEs to showcase the practical application and benefits of green aquaculture practices. These real-world demonstrations were highly appreciated by fellow producers, helping to foster interest and confidence in sustainable approaches. By observing proven techniques firsthand, cohort MSMEs were more inclined to adopt new methods, reinforcing the effectiveness of this learning model.

While the demo ponds clearly played a central role in knowledge transfer and adoption, some had not yet reached harvest by the time of the final evaluation, particularly for the 2025 production cycle. As a result, capturing complete data on production outcomes—such as growth performance, feed conversion ratio (FCR), and income gains—was limited in a few cases. For future programming, aligning evaluation timelines more closely with aquaculture production cycles would

help ensure more accurate measurement of results and reinforce the learning value of the demonstration ponds.

Encouraging Farmer-Led Data Collection: Water quality monitoring was a key strength of the programme, contributing both to environmental stewardship and improved farm management. Monitoring was carried out at both pond and stream levels, with active involvement from youth among the GESI champions, who worked closely alongside technical experts. The programme also equipped participants with the knowledge and tools to monitor water quality in their own ponds, reinforcing the importance of maintaining healthy aquatic environments.

This participatory approach created a strong foundation for environmental awareness and practice. Looking ahead, there is an opportunity to further strengthen farmer-led data collection—particularly by empowering participants to take a more active role in monitoring and analyzing stream-level data in addition to their ponds. Building basic capacity in data recording and interpretation would enhance ownership, reinforce continued learning, and promote long-term adoption of sustainable water management practices beyond the programme's life.

5.2 Key Recommendations

Looking ahead, future programmes aiming to promote sustainable aquaculture in Myanmar—or in similar contexts—can build on several key insights generated by NGA-Myanmar.

Feed Conversion Ratio (FCR): Future programmes should build on the solid foundation laid by NGA-Myanmar in promoting feed efficiency. The concept of FCR was well introduced, and most champion MSMEs showed a good understanding and varying degrees of application. However, some misconceptions remain for some participants—for example, the idea that applying FCR equates to feeding more, which was seen as unaffordable for smaller pond owners. Future efforts should prioritize targeted technical coaching, practical demonstrations, and peer learning to reinforce the full understanding of FCR as a feed optimization tool that improves efficiency and reduces costs. Encouraging MSMEs to maintain accurate feed records and regularly monitor feeding practices can support improved FCR performance.

Access to Finance: Access to finance will remain essential for scaling sustainable aquaculture. NGA-Myanmar made important progress in linking MSMEs to financial institutions through platforms like Htwet Toe and through in-person engagement. Uptake of financial products was cautious, reflecting the complex economic climate and a prudent approach by producers. Future programmes should continue to strengthen financial literacy, particularly in understanding loan terms, repayment schedules, and the strategic use of credit. Equally important is encouraging financial institutions to develop loan products that are better aligned with aquaculture's longer production cycles and irregular cash flows. Tackling structural barriers—such as legal requirements, geographic limitations, and institutional restrictions—will also be essential to unlocking finance for small-scale aquaculture producers.

Results Measurement and Record-Keeping: For future impact measurement, aligning endline evaluations with production cycles is recommended to ensure that harvest outcomes—such as growth rates, income changes, and FCR improvements—can be properly assessed. In addition, encouraging participants to maintain systematic records on feeding, fish growth, and survival rates will improve accuracy in tracking results and foster stronger farmer engagement. Strengthening farmer capacity in data management not only enhances ownership but also equips them with practical tools for day-to-day decision-making in environmentally responsible aquaculture.

Demonstration Ponds and Learning-by-Doing: In the context of NGA-Myanmar, Demonstration ponds proved to be a highly effective tool for farmer-to-farmer learning, offering a tangible way for MSMEs to see green aquaculture practices in action. Future programmes should continue to use these as living classrooms—not just during special events but throughout the production cycle—to encourage replication and reinforce technical practices. Encouraging champions to lead water testing and feed monitoring themselves builds hands-on knowledge and confidence. Simple tools such as short footbridges can support better water sampling practices by improving access to deeper areas of the pond, where more accurate readings can be taken.

Gender Equality and Social Inclusion (GESI): While the programme observed no significant gender-based barriers, future programming should expand GESI messaging to the broader community to build wider awareness and acceptance of inclusive practices. Women's empowerment can be strengthened through improved access to finance, market linkages, and increased visibility of successful women practitioners. Equitable representation among champion MSMEs should also be prioritized to model inclusive leadership and inspire broader adoption of green aquaculture practices.

Digital Tools and Internet of Things (IoT): NGA-Myanmar's early introduction of IoT-based solutions for water quality monitoring revealed strong interest among MSMEs. Future programmes should build on this momentum by investing in user training that enhances the ability to interpret and act on sensor data. Integrating these tools into broader aquaculture training ensures that digital innovations are not standalone but fully embedded in environmentally sound production practices. Younger farmers, in particular, are well-positioned to adopt and promote these technologies, making youth-focused digital and technical training a promising strategy.

Community-Based Support Structures: The role of Field Monitoring Caseworkers (FMCs) was particularly valuable, and future programmes should engage them from the outset. Their local presence helps build trust, ensures timely follow-up, and strengthens the link between training and practice. Embedding local facilitators also enhances the programme's ability to respond to community needs and sustain engagement throughout implementation. Sustaining Impact Beyond the Programme

Participants' continued interest in refresher training and technical support underscores the need for ongoing engagement, even post-programme. While light-touch support may be sufficient, future efforts should maintain avenues—such as the Htwet Toe platform—for MSMEs to access expert guidance and stay connected to market actors. Strengthening youth participation in digital tools and aquaculture innovations can also help ensure the sustainability and growth of green practices in the years ahead.

6. Annexes

Annex 1 List of Reviewed Documents

Sr	Document
1	2. Annex A2 - Mercy Corps Netherlands - Nurturing Green Aquaculture in Myanmar - EC Switch Asia _10Dec21
2	Annex 1 Mid Term Review Report
3	Annex 1 Updated Logframe and Activity Matrix (Y3)
4	Annex 1_Baseline Assessment
5	Annex 2 Barrier Analysis Report
6	Annex 2_Strategic Environmental Assessment
7	Annex 7_Monitoring, Evaluation and Learning (MEL) Plan
8	Final_Report_June23
9	Final_Report_Nov23
10	First, Second, Third_ Bi-annual survey report -FINAL
11	Hydrology Assessment
12	ISO Tech Lab Results_June23
13	MCNL - NGA-Myanmar - Third interim narrative report
14	Seasonal report (monsoon23)
15	Data_entry_WQM_database (Excel)
16	Dataset 3 - Surveys - Fourth Bi-Annual Survey (Jan 2025)_shared to evaluation consultant
17	Fish Digital Community Report 2022-Dec2024
18	KII stakeholder list
19	Knowledge and Practices questions
20	Program Participants_NGA

Annex 2 Assessment Tools (Qualitative and quantitative questions)

Qualitative questions for FGDs, KIIs and MSCs

A. Program Team (Staff, Experts, service provider - KII)

Date	
Facilitator	
Note Taker	
Respondent	Name: Age: Gender:

Self-introduction by facilitator and he/she shall explain that NGA Myanmar has implemented the project name “Nurturing Green Aquaculture – NGA Myanmar Programme”. Now it has come to an end and we would like to understand what has been achieved, effective and useful to the target beneficiaries and what has been challenges and lessons learned throughout the project period. Please, feel to express your own opinion. We guarantee that this interview is only meant for evaluation purpose and your identity will not be used in the report. (1-1:30 hr). Confirm consent from the respondents.

INTRODUCTION

1. Kindly, introduce yourself to us (position and main role) and follow up with the involvement in this project?
2. How did you get involved in this project?
3. What do you have to do in your position? What are your responsibilities?

Relevance	Notes/Quotes

1. How well was the programme design aligned with the needs and priorities of the target population and stakeholders?
2. How well were the programme objectives and activities relevant and responsive to the context?

To what extent does the programme address the identified problems or needs of its beneficiaries and stakeholders?

Coherence	

- To what extent is the programme support Myanmar's transition to a low-carbon, resource-efficient and circular economy?

To what extent is the programme consistent with broader development goals, and does it complement or conflict with other interventions?

Effectiveness	

- How well has the programme achieved its intended objectives?
- How well have the outputs of the programme been achieved? And to what extent have they contributed to the programme objectives?
- How effective are the approaches of the programme in delivering the desired outputs? How can they be improved?
  - Have you been able to reduce your feed conversion ratio (FCR) by 0.2 points or more? How?
  - Have your wastewater parameters improved? What changes have you observed?
  - Have your CO2 emissions decreased? If so, how did the project contribute to this?

Have your incomes increased as a result of adopting green practices? Can you share your experience?

Efficiency	

- To what extent has the programme utilized the resources in relation to the outputs and outcomes achieved
- in terms of financial, human, and material?
- Was there an effective process, built into the management structure for self-monitoring and assessment, reporting and reflection? How well did this mechanism or process work?
  - How much time and effort were involved in designing and making these loan products available?
  - How well did the project utilize resources to reach the target MSMEs?
  - What challenges did you face in delivering the new loan products or campaign messages as well as in organizing in the demonstrations?
  - How efficiently did the project utilize available resources to facilitate these demonstrations?
  - Can you describe the process of providing technical support and facilitating collaborations? Was it smooth and well-coordinated?
  - What challenges did you face in delivering these follow-up activities?

How efficiently were resources allocated to support champion MSMEs and coordinate with private sector partners?

Impact	
● To what extent has the programme contributed to the target population and stakeholders in positively and negatively in term of social, economic, environmental and other relevant dimensions? ● Is the programme bringing about desired changes in the behaviour of people? If so, what is the extent of this change? ➢ How have MSMEs' practices changed as a result of participating in these learning events and demos? ➢ What tangible improvements (e.g., efficiency, environmental impact, cost savings) have been observed among participating MSMEs? What observable changes have occurred in water quality or ecosystem health as a result of the project activities?	
Sustainability	
● To what extent are the programme's benefits, outcomes, and impacts likely to be sustained over time? ● How well are all key stakeholders sufficiently and effectively involved? And how well are their expectations met and are they satisfied with their level of participation? ● Are alternative or additional measures needed and, if so, what is required to ensure continued sustainability and positive impact? ➢ Do MSMEs or local authorities have the capacity and motivation to continue water quality monitoring and environmental assessments? ➢ What ongoing support or capacity-building is needed to maintain high-quality data collection and analysis? What challenges might hinder the long-term sustainability of these data and assessments, and how can they be addressed?	
Challenges/Lessons learned/Recommendation	
• Are there any challenges you faced during the implementation? • What are the challenges? • How did you overcome them? • Did it affect program change or adjustment? • Are there anything / activities you think you could have done differently? • What are they? Why? Do you have any suggestions for this project?	

Questions to Technology Companies (Agrosolar Myanmar/Space & Universe/VNMM)

1. Could you elaborate on the technologies that have been identified for the NGA-Myanmar project? How well suited is your technology to the NGA project? How does your company's technology contribute sustainably to the environment and resource efficiency? When did you start?
2. How many numbers of machines has been provided to the NGA programme? Does your company provide warranty for your technology? What are the pros and cons of your technology?
3. Do you offer any training or training materials on how to use the technology? Please, explain the offer scheme?

4. Do you provide your technology for other programme in Myanmar or other nations in addition to the NGA programme?
5. Have you gathered any user feedback for the NGA programme? What kind of feedback did you receive?
6. Please describe if you have any recommendations about how to enhance the technical support for implementing the NGA programme.

Questions to Financial Institutions

1. What kind of financial support is offered by your organisation to the NGA programme?
2. What are the primary criteria that your organisation considers when evaluating applicants for loans to ensure they meet the requirements and standards set by your organisation?
3. What were the main goals and anticipated results when you decided to support this project?
4. Can you provide insights into the types and number of loans that have already been extended to farmers under the project?
5. What is the credit rate of your loan? How did you determine that the credit is viable for the farmers?
6. Have there been any challenges in financial provision to farmers in the NGA programme?
7. What indicators does your organisation use to measure the impact of your funding on the NGA Project?
8. Is there a plan for your organisation to continue offering loans to farmers beyond the conclusion of the NGA-Myanmar project?
9. Do you have any recommendations or constructive feedback regarding the current process of providing loans that could lead to improvements or enhancements?

B. Champion MSMEs (Men-led, women-led and cohort - FGDs)

The facilitator will introduce themselves and explain that NGA Myanmar has implemented the project named “Nurturing Green Aquaculture – NGA Myanmar Programme”. Now it has come to an end, and we would like to understand what has been achieved, practical and useful to the target beneficiaries and what the challenges and lessons learned throughout the project period. Please feel free to express your own opinion. We guarantee that this interview is only meant for evaluation purposes and your identity will not be used in the report. (1-1:30 hr). Confirm consent from the respondents.

Date	
Facilitator	
Note Taker	
Time	Start: End:

No	Participants’ name	Age	Gender	Village
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

11				
12				

INTRODUCTION

1. Please introduce yourself to us (MSMEs–type/acres) and provide an update on your involvement in this project.
2. Could you please describe the type of business you are engaged in?
3. IF there are any challenges that your business faces, please explain them.
4. Please, share with us what you know about the NGA-Myanmar project in your area? How did you hear about it?
5. What services have you received from the NGA-Myanmar project so far? Please, explain?
6. How has the participation of women and youth been in these trainings? Are there any gender differences in access to and participation in NGA program activities and services? Have specific genders experienced greater or lesser benefits from the program, and if so, Why? (Probe – is the participation adequate? What are some of the barriers to women and youth participating in training? What can be done differently to encourage more women and youth participation?

Relevance	Notes/Quotes
1. In your opinion, do the green practices promoted by the project match your business goals and environmental concerns? 2. Are the project activities aligned with your needs, your priorities and with the needs of the MSMEs in the aquaculture industry? 3. How did the customized loans influence your decision to adopt green technologies and practices? 4. How these loan options align with your business goals and sustainability priorities? 5. Why did you choose to participate and what motivated you to participate in green aquaculture practices? 6. How does increasing awareness among MSMEs influence your business or community's sustainability goals? 7. How well do the training and awareness activities align with the current needs and challenges faced by MSMEs in adopting green aquaculture? 8. Why do you think reducing water pollution is important for your business and community? 9. How relevant do you find the information provided on water quality and pollution reduction to your operational decisions? Why do you think reducing water pollution is important for your business and community?	
Effectiveness	
1. Have you adopted the critical and desirable/non-critical green practices promoted by the project? Why or why not? 2. What specific changes have you made as a result of the project? 3. Can you describe any improvements in resource efficiency, water quality, or other environmental parameters?	

4. Have you noticed any economic benefits (cost savings, increased income) from adopting these practices?
5. What factors influenced your decision to adopt or not adopt certain practices?
6. How did access to financing influence your ability to implement green innovations?
7. Did the loan lead to measurable changes in your operations, resource efficiency, or environmental impact?
8. To what extent do you think your knowledge and awareness about green aquaculture have increased?
9. How has the project empowered gender champions to share responsibilities and disseminate information within their households and communities?
10. For female entrepreneurs: how has the training supported you in establishing or strengthening your aquaculture business?
11. Can you share examples of changes in practices or behaviours resulting from the training and awareness sessions?
12. To what extent have you taken actions to improve water quality based on the environmental data?
13. Have you observed any improvements in water quality or environmental conditions as a result of your work?

What challenges did you encounter in utilizing the loan funds effectively, in implementing or maintaining these adaptive actions, and in applying the knowledge gained?

Efficiency	

1. Can you describe the process of receiving the customized loan products? Was it a smooth process?
2. How much time and effort was required in receiving these loan products?
3. What challenges did you face in accessing or understanding the new loan products or campaign messages?
4. Were the demonstrations delivered in a manner that maximized learning and engagement?
5. What challenges did you encounter in participating in the demonstrations?
6. Were the workshops and training scheduled at appropriate times and locations for your participation?
7. What challenges were faced in gathering water quality data?
8. How effectively were technological tools (e.g., online data platforms) utilized to facilitate data sharing and accessibility?

Were the resources allocated sufficient to ensure quality and consistency in data collection and reporting?

Impact	

1. What observable changes did you see in your area in terms of water quality or ecosystem health as a result of the project activities?
2. What do you think if the environmental assessments contributed to increased awareness among MSMEs and local communities about sustainable practices?
3. Do you think that green aquaculture projects attracted investment or funding? Does it influence MSMEs' attitudes or behaviors towards green aquaculture?

4. How has your business or the community benefited socially or economically? 5. Have you observed environmental improvements, such as better water quality or reduced pollution? □ 6. Have these practices influenced your relationships with buyers, suppliers, or the community? Do you see any social or community benefits resulting from the project?
Sustainability
1. Have the project activities influenced your capacity or motivation to sustain environmentally friendly practices? If yes, how?□ 2. Do you plan to continue or expand the adoption of these green practices after the project ends? Why or why not?□ 3. What factors will support or hinder the ongoing use of these practices?□ 4. Have the skills, knowledge, and resources gained through the project increased your confidence to sustain these practices?□ 5. What additional support or resources would help ensure the long-term sustainability of these practices?□ 6. How do you see the future of resource-efficient and cleaner aquaculture in your business? 7. How can you sustain or build upon the knowledge gained from these demonstrations?□ What role do ongoing support or follow-up activities play in maintaining these practices?□
Challenges/Lessons learned/Recommendation
• Are there any challenges you faced during the project? • What are the challenges? • How did the project helped you to overcome them? • Are there anything / activities you think it could be done differently? • What are they? Why? Do you have any suggestions for this project?

C. Most Significant Change (MSC – Success stories or case studies)

Date				
Facilitator				
Note Taker				
Respondent	Name:	Age:	Gender:	Location:

Self-introduction by facilitator and he/she shall explain that NGA Myanmar has implemented the project name “Nurturing Green Aquaculture – NGA Myanmar Programme”. Now it has come to an end and we would like to understand what has been achieved, effective and useful to the target beneficiaries and what has been challenges and lessons learned throughout the project period. Please, feel to express your own opinion. We guarantee that this interview is only meant for evaluation purpose and your identity will not be used in the report. (1-1:30 hr). Confirm consent from the respondents.

INTRODUCTION

1. Kindly, introduce yourself to us (MSMEs – type/acres) and follow up with the involvement in this project such as demonstration plot?

2. How did you get involved in this project?
3. What are the most important things you learned from this project? Do you adopt some practices? Give examples. Are you still practicing it?

Probe: Ask about training, field days, demo ponds, small-scale feeding machines, solar pump, "Htwet Toe" application, etc., Probe for pond management, fish health, better management practices, GESI, etc.,

MSC questions	Notes/Quotes
1. Since being involved in this project, what is the biggest change you've experienced? (probe – renewable energy, pellet feed, FCR)	
Why is this change significant to you? What success? Which one is more benefit?	
What has been helpful for your success? How has NGA-Myanmar helped with this change?	
To be more successful, what are other things do you think the programme could have done? (e.g., more technical support – what kind of green tech?	
3. What has been worrying you? How have you managed or how can you manage to overcome such worries? • Fish market • Fish feed • Profit/money • Law & rights • Community • Health • Environment / world • Family & relationships • Any other?	
What next for you? Can you tell me little about your next plan? (Will you continue to use green aquaculture tech in the future, which one do you think you will use?)	

Quantitative questionnaires

Introduction

This survey is an end-line evaluation exercise. It will take approximately about 30 minutes. The objective of the survey is to obtain information on the impact of the project that NGA – Myanmar programme implemented in your area. This survey aims to explore outcomes from the activities under income status, adopting both critical and desirable/non-critical greener aquaculture practices and green tech and knowledge improvement on the green aquaculture concept and practices. The answers to all the questions are voluntary, and you may choose not to answer or discontinue if you feel unsafe or unwilling.

Your answers to questions will be kept highly confidential. The assessment team will share the analysis of this survey's results without mentioning any personal data that may reveal your identity.

The following survey questions cover basic demographic information and measurable activities by target indicator. Your participation in this survey is greatly appreciated.

ဤစစ်တမ်းသည် စီမံကိန်းလုပ်ငန်းများအပြီး လုပ်ဆောင်လေ့ရှိသည့် စစ်တမ်းတစ်ခုဖြစ်ပါသည်။ စစ်တမ်းဖြေဆိုရန် အချိန်အားဖြင့် မိနစ် (၃၀) ခန့် ကြာမြင့်ပါမည်။ ဤစစ်တမ်းကောက်ယူရသည့် ရည်ရွယ်ချက်မှာ NGA-Myanmar programme စီမံကိန်း၏ အကျိုးသက်ရောက်မှုအချက်အလက်များ သိရှိစေရန် လုပ်ဆောင်ခြင်းဖြစ်ပါသည်။

ဖြေဆိုရမည့် မေးခွန်းများမှာ မိမိဆန္ဒအလျောက် လွတ်လွတ်လပ်လပ်ဖြေဆိုရမည်ဖြစ်ပြီး လုံခြုံမှုမရှိခြင်း သို့ ဖြေဆိုရန် ဆန္ဒမရှိပါက ဤစစ်တမ်းကို ရပ်နားနိုင်ပါသည်။ ဖြေဆိုသည့် အဖြေများကိုလည်း လုံခြုံလျှို့ဝှက်စွာ သိမ်းထားမည်ဖြစ်ပြီး သုံးသပ်သည့်အဖွဲ့ကသာ အချက်အလက် သုံးသပ်သည့်အခါတွင် သာ အသုံးပြုသွားပါမည်။ အစီရင်ခံရာတွင်လည်း ဖြေဆိုသူများ၏ အမည် ဒေသများကို ဖော်ညွှန်းသွားမည် မဟုတ်ပါ။

မေးခွန်းများမှာ ဖြေဆိုသူများ၏ အခြေခံအကြောင်းအရာများ၊ စီမံကိန်းမှ လုပ်ဆောင်ခဲ့သော လုပ်ငန်းစဉ်များနှင့် သက်ဆိုင်သည့် မေးခွန်းများဖြစ်ပါသည်။ ဤစစ်တမ်းတွင် ပါဝင်ဖြေဆိုပေးသည့်အတွက် ကျေးဇူးတင်ပါသည်။

Consent obtaining

0	Do you agree to take part in this survey?	Yes, No	ဤစစ်တမ်းတွင် ပါဝင်ရန် သဘောတူပါသလား။	တူပါတယ်။ မတူပါ။

Introduction *(all respondents)*			***၁။ မိတ်ဆက်***	***လမ်းညွှန်ချက်***
1.1	Date of Interviews	*(Fill)- Auto calendar)*	ရက်စွဲ	(အော်တိုဖြည့်ရန်)
1.2	Enumerator's name	*(Fill) – name of enumerator)*	စစ်တမ်းကောက်သူအမည်	ဖြည့်ပါ
1.3	Location of the interviews	*Select One* Twantay, Maubin, Nyaungdon	အင်တာဗျူး တည်နေရာ	*တွံတေး၊ မအူပင်၊ ညောင်တုန်း*
1.4	Village name	*(Fill)*	ရွာအမည်	*တစ်ခုရွေးပါ*
1.5	Clustered village	Aung Heik Hta Nee Kyitan Let Kyar Gyi Ma Let To Ta Ka Hleit Ta Zin Yae Kyaw Sar Ma Lauk Set Kawt Taung Par Hleit Kyein Chaung Shan Ta Lin	စီမံကိန်းမှဖွဲ့ထားသော ရွာအစု	အောင်ဟိတ် ဓနိး ကျည်တန်း လက်ျားကြီး မလက်တို ဒကလဲ့ သဇင် ရေကျော် ဆားမလောက် ဆက်ကော်တောင် ပါလဲ့

				ကျိန်ခြောင်း ရှမ်းတလင်း

Demographic *(all respondents)*			***အခြေခံ အချက်အလက်***	
2.1	Sex	(*Select only one option)* Male, Female, Prefer Not to Answer	ကျား/မ	ကျား မ မဖြေဆိုလိုပါ
2.2	Respondent Type	*Select one option* *Men-led MSMEs,* *Women-led MSMEs* *Cohort*	ဖြေဆိုသူအမျိုးအစား	
2.3	Age	(*Select only one option)* Under 18 years, 18-35 years, 36-59 years, 60 years +	အသက်	၁၈ နှစ်အောက်, ၁၈-၃၅, ၃၆-၅၉, ၆၀+
2.4	Ethnicity	(*Select only one option)* *Kayin* *Bama* *other*	လူမျိုး	ကရင် ဗမာ အခြား
2.5	Religion	Christian Buddhist Muslim Hindu	ကိုးကွယ်သည့် ဘာသာ	ခရစ်ယာန် ဗုဒ္ဓဘာသာ အစ္စလာမ်ဘာသာ ဟိန္ဒူဘာသာ

		Other		အခြား
Section (1) % increase in incomes of champion MSMEs adopting both critical and desirable/non-critical green aquaculture practices and green tech.				
1.1	What is your main source of income/s?	Aquaculture Agriculture Livestock rearing Self Employed Perennial Crops Skill Labor Trading Fishing/Fisheries Transporting Service Remittance Rental service Others	၁.၁ သင့်၏ အဓိက ဝင်ငွေရရှိသည့် လမ်းကြောင်း/များကို ရွေးပါ။	ငါးမွေးမြူရေး စိုက်ပျိုးရေး တိရိစ္ဆာန်မွေးမြူရေး ကိုယ်ပိုင်အလုပ် နှစ်ရှည်သီးနှံ ကျွမ်းကျင်အလုပ်သမား အရောင်းအဝယ် ငါးဖမ်းလုပ်ငန်း သယ်ယူပို့ဆောင်ရေးလုပ်ငန်း ငွေလွှဲ ပစ္စည်းငှါးရမ်းသည့်လုပ်ငန်း အခြား
1.2	Estimate Annual Income	Aquaculture _____ Agriculture _____ Livestock rearing _____ Self Employed _____ Perennial Crops _____ Skill Labor _____ Trading _____	နှစ်စဉ် ခန့်မှန်း ဝင်ငွေ ရေးပေးပါ	ငါးမွေးမြူရေး _____ စိုက်ပျိုးရေး _____ တိရိစ္ဆာန်မွေးမြူရေး _____ ကိုယ်ပိုင်အလုပ် _____ နှစ်ရှည်သီးနှံ _____ ကျွမ်းကျင်အလုပ်သမား _____ အရောင်းအဝယ် _____

		Fishing/Fisheries _____ Transporting Service ___ Remittance _____ Rental service _____ Others _____		ငါးဖမ်းလုပ်ငန်း _____ သယ်ယူပို့ဆောင်ရေးလုပ်ငန်း _____ ငွေလွဲ _____ ပစ္စည်းငှါးရမ်းသည့်လုပ်ငန်း _____ အခြား _____
1.3	Do you think your income has increased after using green aquaculture technique?	Yes, No	သင်သည် စိမ်းလန်းငါးမွေးမြူရေး နည်းပညာကို အသုံးပြုပြီးနောက် သင့်ဝင်ငွေ တိုးလာတယ်လို့ ထင်ပါသလား။	တိုးလာပါတယ် မတိုးလာပါ။
1.3.1	If yes, why	Write	တိုးလာလျှင် မည်သည့်အကြောင်းအရာကြောင့် တိုးပါသလဲ။	
1.3.2	If no, why?	Write	မတိုးလာပါ ဟု ဖြေပါက ဘာကြောင့်လဲ။ အကြောင်းအရင်းကို ဖော်ပြပါ။	ရေးပါ။
1.4	How much was your income per year last year?	Aquaculture _____ Agriculture _____ Livestock rearing _____ Self Employed _____ Perennial Crops _____ Skill Labor _____ Trading _____ Fishing/Fisheries _____ Transporting Service ___	မနှစ်က နှစ်စဉ် ခန့်မှန်း ဝင်ငွေ ရေးပေးပါ	ငါးမွေးမြူရေး _____ စိုက်ပျိုးရေး _____ တိရိစ္ဆာန်မွေးမြူရေး _____ ကိုယ်ပိုင်အလုပ် _____ နှစ်ရှည်သီးနှံ _____ ကျွမ်းကျင်အလုပ်သမား _____ အရောင်းအဝယ် _____ ငါးဖမ်းလုပ်ငန်း _____ သယ်ယူပို့ဆောင်ရေးလုပ်ငန်း _____

		Remittance _____ Rental service _____ Others _____		ငွေလွဲ _____ ပစ္စည်းငှါးရမ်းသည့်လုပ်ငန်း _____ အခြား _____
1.5	Who makes decision to spend?	Men, Women	ရရှိလာသော ဝင်ငွေကို လုပ်ငန်းအတွင်း ပြန်သုံးရာတွင် မည်သူက ဆုံးဖြတ်ပါသလဲ	အမျိုးသား အမျိုးသမီး
1.6	What is your type of pond?	Mangrove Earth Ponds Floating cages Farm land Other	သင့်၏ ငါးကန်အမျိုးအစားကို ရွေးပါ။	လမုတော ငါးကန် မြေသားငါးကန် ရေမျှော ငါးခြင်းတောင်း စိုက်ပျိုးမြေငါးကန် အခြား
1.7	How many ponds do you own?	Write	သင့်တွင် ငါးကန်အရေအတွက် မည်မျှ ရှိပါသလဲ။	ရေးပါ
1.8	What is the total size?	Write	စုစုပေါင်း ငါးကန်ဧရိယာ မည်မျှရှိပါသလဲ။	ရေးပါ
1.9	When did you start your aquaculture business?	Write	သင်သည် ငါးမွေးမြူရေးလုပ်ငန်းကို ဘယ်အချိန်က စတင်လုပ်ကိုင် ခဲ့ပါသလဲ။	ခုနှစ် ရေးပါ။
1.10	What are your selling practices?	Cash down Advanced	သင့်၏ ငါးရောင်းသည့် ပုံစံ။	လက်ငင်းငွေချေ ကြိုငွေ
Section (2) % of champion MSMEs adopting both critical and desirable/non-critical greener aquaculture practices and green tech.				
Critical Practices checklist				
Efficient use of resources				

2.1	Reuse, recycle or recirculate your pond's water for other productive use.	Yes, No, I don't know, No answer	ညစ်ညမ်းမှုပမာဏကို လျှော့ချရန် ကန်ရေကို အခြားအသုံးပြုမှုအတွက် ပြန်လည်အသုံး ပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.2	Reuse, recycle or recirculate other resources from your pond (i.e., nutrient soils) for other productive use.	Yes, No, I don't know, No answer	ညစ်ညမ်းမှုပမာဏကို လျှော့ချရန် သင့်ကန်မှ စွန့်ပစ်ပစ္စည်းများ(ဥပမာ-ကောင်းသောမြေဆီလွှာများ)ကို အခြားအသုံးပြုမှုအတွက် ပြန်လည်အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.3	Regularly maintain water pumps, filters and other equipment.	Yes, No, I don't know, No answer	ရေစုပ်ပန့်၊ ရေစစ်နှင့်အခြားကိရိယာများ ကို ပုံမှန် ထိန်းသိမ်းပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.4	Regularly check your pond's pH level	Yes, No, I don't know, No answer	ကန်၏ pH အဆင့်ကို ပုံမှန်စစ်ဆေးပါ သလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.5	Regularly check your pond's water clarity	Yes, No, I don't know, No answer	ကန်၏ ရေ ကြည်မှုအတိုင်းအတာကို ပုံမှန်စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

2.6	Regularly check your pond's temperature	Yes, No, I don't know, No answer	ကန်၏ အပူချိန်ကို ပုံမှန်စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.7	Regularly check your pond's Nitrate Nitrogen level	Yes, No, I don't know, No answer	ကန်၏ Nitrate Nitrogen အဆင့်ကို ပုံမှန်စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.8	Regularly check your pond's Nitrite Nitrogen level	Yes, No, I don't know, No answer	ကန်၏ Nitrite Nitrogen အဆင့်ကို ပုံမှန် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.9	Regularly check your pond's Phosphate level	Yes, No, I don't know, No answer	ကန်၏ Phosphate အဆင့်ကို ပုံမှန် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.10	Regularly check your pond's ammonia level?	Yes, No, I don't know, No answer	ကန်၏ ammonia အဆင့်ကို ပုံမှန် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

2.11	Regularly check your pond's Dissolved Oxygen (DO) level	Yes, No, I don't know, No answer	ကန်၏ Dissolved Oxygen (DO) အဆင့်ကို ပုံမှန် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.12	Regularly do visual monitoring to check fish movements, and their feeding behaviours.	Yes, No, I don't know, No answer	ငါးများ၏ လှုပ်ရှားမှုနှင့် ၎င်းတို့၏ အစာစားသည့် အလေ့အထများကို မျက်မြင် ပုံမှန် စောင့်ကြည့်စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.13	Regularly do visual monitoring to check the colour and smell of pond water.	Yes, No, I don't know, No answer	ကန်ရေ၏ အရောင်နှင့်အနံ့ကို ပုံမှန် စောင့်ကြည့် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.14	Calculate Feed Conversion Ratio (FCR)	Yes, No, I don't know, No answer	ငါးစာ အချိုးကို တွက်ချက်ပါသလား။ (Feed Conversion Ratio – FCR)	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.15	Use floating and pelleted feed with improved formulation.	Yes, No, I don't know, No answer	နည်းစနစ် အဆင့်မြင့်တင် ဖော်ဆပ်ထားသော ရေပေါ် အစာတောင့်များကို အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.16	Nurture and use natural green water as natural feed	Yes, No, I don't know, No answer	သဘာဝအစာ (ဥပမာ - ဓါတ်မြေဩဇာသို့ တိရိစ္ဆာန် ချေး ကို ကောင်းမွန်စွာ	သုံးပါတယ်။ မသုံးပါ

	(i.e., by properly applying fertilizers or animal dungs)		အသုံးပြုထားသော အစာ) ကဲ့သို့ သဘာဝ အစိမ်းရောင်ရေကို ပြုစု ပျိုးထောင် အသုံးပြုပါသလား။	မသိပါ။ မဖြေဆိုပါ။
2.17	Use feed that is produced from sustainable sources (local agricultural waste, fish waste, etc.)	Yes, No, I don't know, No answer	ရေရှည်ကောင်းမွန်သော အရင်းမြစ်များမှ (စိုက်ပျိုးရေး စွန့်ပစ်ပစ္စည်း၊ ငါး စွန့်ပစ်ပစ္စည်း စသည်) ပြုလုပ်ထား သော အစာများ အသုံးပြုထားပါသ လား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.18	Minimize the use of wild-caught fish as feed.	Yes, No, I don't know, No answer	ငါးရှိုင်းများဖမ်းပြီး အစာအဖြင့် အသုံးပြုခြင်းကို လျော့ချပါသလား။	လျော့ပါတယ် မလျော့ပါ မသိပါ။ မဖြေဆိုပါ။
2.19	When transferring fingerlings/larvae, acclimatize them before stocking to reduce mortality rate	Yes, No, I don't know, No answer	ငါးသားပေါက်များ ရွှေ့သည့်အခါ ကန်ထဲမထည့်မီ သေဆုံးမှုလျော့ချရန် နေသားကျအောင်ပြုလုပ်ပြီးမှ ကန်ထဲ ထည့်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.20	Apply correct or recommended stocking density	Yes, No, I don't know, No answer	အကြံပြုထားသည့် သို့ မှန်ကန်သည့် ကန် အကျယ်အဝန်းနှင့်ငါးအရေ အတွက် ကို အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
Limit Chemical Use				

2.21	I do not use antibiotics.	Yes, No, I don't know, No answer	ပဋိဇီဝဆေး များ အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.22	I do not use pesticides	Yes, No, I don't know, No answer	ပိုးသတ်ဆေးများ အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.23	I do not use herbicides.	Yes, No, I don't know, No answer	ပေါင်းသတ်ဆေးများ အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.24	Applying lime appropriately (i.e., after the pond dry, between 200 and 250 viss (or around 20 - 25 bags) per acre)	Yes, No, I don't know, No answer	ထုံးကို မှန်ကန်စွာ သင့်လျော်စွာ အသုံးပြုပါသလား (ဥပမာ - ကန်ခြောက်ပြီးနောက် ထုံး ပိဿာ ၂၀၀ နှင့် ၂၅၀ အကြား သို့ ထုံးအိတ် ၂၀ မှ ၂၅ - ၁၀ ပိဿာ အိတ် - တစ်ဧကလျှင်)	သုံးပါတယ်။ မသုံးပါ။ မသိပါ။ မဖြေဆိုပါ။
2.25	Do you use lime for your ponds?	Yes, No, I don't know, No answer	သင့်ကန်အတွက် ထုံးကို အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.26	How much per acre?	Write	တစ်ဧကလျှင် မည်မျှ အသုံးပြုပါသလဲ။	ရေးပါ

2.27	When do you use it?	Write	မည်သည့်အချိန်တွင် အသုံးပြုပါသလဲ။	ရေးပါ
2.28	Applying fertilizers appropriately to support the production of natural feed (i.e. fitoplankton). This can be around 7 to 8.5 viss of NPK per acre, or around 4.8-6 viss of urea per acre , or around 439-617 viss of natural manure (buffalo dung, cow dung) per acre.	Yes, No, I don't know, No answer	သဘာဝ အစာထုတ်နိုင်ရန် ဓါတ်မြေဩဇာကို သင့်လျော်စွာ အသုံးပြုပါသလား (ဥပမာ - ဖိုင်တိုပလန်တွန်)။ ထိုသို့ အသုံးပြုရာတွင် တစ်ကေလျှင် NPK ၈.၅ ပိဿာ သို့ ယူရီးယား ၄.၈ - ၆ ပိဿာ သို့ တစ်ကေလျှင် သဘာဝ မြေဩဇာ (နွား/ကျွဲချေး) ပိဿာ ၄၃၉ - ၆၁၇)။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.29	Do you use fertilizers for your ponds?	Yes, No, I don't know, No answer	သင်သည် သင့်ကန်အတွက် ဓါတ်မြေဩဇာ အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.30	How much per acre?	Write	တစ်ကေလျှင် မည်မျှ အသုံးပြုပါသလဲ။	ရေးပါ
2.31	When do you use it?	Write	မည်သည့်အချိန်တွင် အသုံးပြုပါသလဲ။	ရေးပါ
Waste Management				
2.32	Carry out water treatment before discharging it to the natural water streams	Yes, No, I don't know, No answer	သဘာဝ မြစ်ချောင်းများသို့ မစွန့်ထုတ်မီ ရေကို ကုသမှု ပြုလုပ်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

2.33	Reduce the use of plastics and not throwing them (or other waste) to the environment	Yes, No, I don't know, No answer	ပလပ်စတစ် (အခြား စွန့်ပစ်ပစ္စည်းများ) များကို ပတ်ဝန်းကျင်အတွင်းသို့ မပစ်ပဲ အသုံးပြုမှုကို လျော့ချပါသလား။	လျော့ပါတယ် မလျော့ပါ မသိပါ မဖြေဆိုပါ
2.34	Where do you put them?	Write	ထိုစွန့်ပစ်ပစ္စည်းများကို ဘယ်မှာ ပစ်ပါသလဲ။	ရေးပါ
2.35	How do you dispose it?	Write	မည်သို့ စွန့်ပစ်ပါသလဲ။	ရေးပါ
2.36	Closely monitor pond bottom sediments during pond harvesting time so that it will not go to natural streams.	Yes, No, I don't know, No answer	ကန်ကြမ်းပြင် အနယ်များကို ကန်ဖော်သည့်ကာလအတွင်း အနီးကပ် စောင့်ကြည့်ပါသလား။ ဤသို့လုပ်ဆောင်ခြင်းဖြင့် ထို အနယ်များသည် သဘာဝ ချောင်းများအတွင်းသို့ မစီးဆင်းသွားမှာ ဖြစ်ပါတယ်။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.37	Prevent/minimize oil/diesel leakage from your diesel-powered pumps or other relevant equipment.	Yes, No, I don't know, No answer	ဒီဇယ်ရေစုပ်စက်များ သို့ အခြား ကိရိယာမှ ယိုစိမ့်ထွက်လာသော ဆီ/ဒီဇယ် ကာကွယ်ခြင်း/နဲနိုင်သမျှနဲအောင် ပြုလုပ်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
Use of renewable energy sources				
2.38	Use renewable energy sources, such as wind, solar and tidal power instead of fuel usage.	Yes, No, I don't know, No answer	လောင်ဆာအသုံးမပြုပဲ ပြန်လည် ဖြည့်ဖြိုးမြဲ စွမ်းအင်အရင်းအမြစ်များဖြစ်သည့် လေ၊ ဆိုလာနှင့်ဒီရေ - စသည့်တို့ကို အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။

2.38 .1	If yes, which renewal energy do you use?	Write	မည်သည့် ဖြည့်ဖြိုးမြဲ စွမ်းအင်ကို အသုံးပြုပါသလဲ။	ရေးပါ
Desirable Practices Checklist				
Use of responsible seed sources				
2.39	Source seeds (fingerlings, larvae) from hatcheries that use responsible practices	Yes, No, I don't know, No answer	တာဝန်ခံမှုရှိသော အလေ့အထများကို အသုံးပြုပြီး ထုတ်လုပ်သော သားဖေါက်လုပ်ငန်းများမှ (ငါးသားပေါက်များ) မျိုးငါးများ အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.40	Do you use invasive species?	Yes, No, I don't know, No answer	ထိုးဖောက်ပြန့်ပွားနှောက်ယှက်သည့် မျိုးများအသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.41	Do you use local species?	Yes, No, I don't know, No answer	သင် ဒေသ မျိုးရင်းများကို အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.42	Select and use breed/species with fast growth.	Yes, No, I don't know, No answer	မျိုးကောင်း မျိုးသန့်၊ ကြီးထွားနှုန်းအရှိန်ရနေသော မျိုးများကို ရွေးချယ် အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။

2.43	Select and use breed/species that resistance to disease.	Yes, No, I don't know, No answer	ရောဂါဒဏ်ခံနိုင်သော မျိုးများကို ရွေးချယ် အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
2.44	Select and use breed/species with improved feed conversion ratio (FCR).	Yes, No, I don't know, No answer	အဆင့်မြင့်တင်ထားသော အစာရောစပ်သည့် အချိုးဖြင့် မွေးမြူထားသော မျိုးများကို ရွေးချယ် အသုံးပြုပါသလား။	သုံးပါတယ်။ မသုံးပါ မသိပါ။ မဖြေဆိုပါ။
Integrated aquaculture systems				
2.45	Combine aquaculture with other complementary agricultural activities, such as fish and chicken, fish and shrimp, fish and rice, or using fish waste as fertilizer for crops	Yes, No, I don't know, No answer	ငါးမွေးမြူရေးနှင့်အခြား ဖြည့်စွက်စိုက်ပျိုးရေး လုပ်ငန်းများ (ငါးနှင့်ကြက်၊ ငါးနှင့်ပုဇွန်၊ ငါးနှင့်စပါး၊ သို့ ငါး စွန့်ပစ်ပစ္စည်းများကို သီးနှံများအတွက် ဓါတ်မြေဩဇာအဖြစ် ပေါင်းစပ်လုပ်ကိုင်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
Use of Natural Treatments				
2.46	Regularly check pond to see any disease sources like pathogen, host, and habitat to prevent disease outbreak.	Yes, No, I don't know, No answer	ရောဂါဖြစ်ပွားခြင်းမှ ကာကွယ်ရန် ရောဂါဖြစ်စေနိုင်သည့် အရင်းအမြစ်များဖြစ်သည့် ပိုး၊ ပေါက်ဖွားရာနေရာနှင့်နေထိုင်သည့်နေရာများကို ငါးကန်အတွင်း ပုံမှန်စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

2.47	Add natural supplements (vitamin C, minerals, probiotics) to the fish to improve their immune system?	Yes, No, I don't know, No answer	ငါးများ၏ ကိုယ်ခံအားမြင့်တင်ပေးရန် သဘာဝဖြည့်စွက်စာ (ဗီုင်တာမင်၊ သတ္တုဓါတ်များ၊ အကျိုးပြုဘတ်တီးရီးယား) ထည့်ပေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.48	Use the 'bathing' method to treat fish disease. (fish bathing)	Yes, No, I don't know, No answer	ငါးရောဂါ ကုသရန် ငါးရေချိုးပေးသည့် နည်းလမ်းကို အသုံးပြုပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
Select and manage pond site/location				
2.49	Carefully select pond sites	Yes, No, I don't know, No answer	ငါးကန်ပြုလုပ်မည့်နေရာများကို သေချာ ရွေးချယ်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။
2.50	Do you cut trees when making any new pond	Yes, No, I don't know, No answer	ငါးကန်အသစ်လုပ်ရာတွင် သစ်ပင်များကို ခုတ်ထွင် ရှင်းလင်းပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.51	Do you do treatment when transferring fingerlings to the new pond?	Yes, No, I don't know, No answer	ငါးသားပေါက်များကို ကန်အသစ်အတွင်းသို့ ပြောင်းထည့်သည့်အခါ ကုသမှု ပြုလုပ်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

2.52	If yes, write steps (rest, fish bath, release)	write	ကုသမှု ပြုလုပ်သည်ဟု ဖြေပါက မည်သည့် အဆင့်များ ပြုလုပ်ပါသလဲ။ (အနားပေး၊ ငါးရေချိုးနည်းစနစ်)	ရေးပါ
2.53	Install and monitor water inlet/outlet gates with screen mesh that is small enough or any other effective filtration systems to prevent the entry and potential escape of aquatic species in the drainage channels.	Yes, No, I don't know, No answer	ရေထုတ်မြောင်းများအတွင်းသို့ ငါးမျိုးများ ဝင်လာခြင်း ထွက်သွားခြင်း မဖြစ်စေရန် ရေ ဝင်/ထွက် ဂိတ်များကို လုံလောက်သည့် သေးငယ်မှုရှိသော သံဇကာ သို့ အခြား ထိရောက်သည့် ရေစစ်ထုတ်သည့် စနစ်များ တပ်ဆင် စောင့်ကြည့်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
2.54	Carry out proper pond design and preparation, such as by making pond's settling basin, installing gravel filtration on pond discharge structures, cleaning mud from the bottom of the pond until only 20 cm (8 inches) remains, and adding lime	Yes, No, I don't know, No answer	ငါးကန် အနယ်ချသည့် ကြမ်းပြင်၊ ကျောက်စရစ် ရေစစ်ကို စွန့်ထုတ်နေရာ တွင်တပ်ဆင်ခြင်း၊ ကန်ကြမ်းပြင်မှ ၂၀ စင်တီမီတာ (၈ လက်မ) ကျန်သည့်အထိ သန့်ရှင်းခြင်း၊ ထုံးထည့်ပြီး ကန်ကို အခြောက်ခံခြင်း (တစ်ပတ်သို့ မြေ ပတ်ကြားအပ်သည့်အထိ) စသည့်များကို ငါကန်ဒီဇိုင်းနှင့်ပြင်ဆင်ခြင်းများကို ကောင်းမွန်စွာ လုပ်ဆောင်ပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။

	and drying the pond for around one week or until cracks occur.			
2.55	Regularly check the pond environment including dike, drainages, and its surrounding environment.	Yes, No, I don't know, No answer	ငါးကန်ပတ်ဝန်းကျင်ကို ဒိုက်၊ ရေမြောင်းများနှင့် ၎င်း၏ ပတ်ပတ် လည် ပတ်ဝန်းကျင်များအပါ အဝင် ပုံမှန် စစ်ဆေးပါသလား။	လုပ်ပါတယ်။ မလုပ်ပါ မသိပါ။ မဖြေဆိုပါ။
Section (3) % of champion enterprises demonstrating satisfactory knowledge of green aquaculture concepts and practices.				
Knowledge (baseline questions)				
3.1	It is necessary to check water quality on regular basis.	Agree, strongly agree, neutral, disagree, strongly disagree	ငါး/ပုစွန်ကန်၏ ရေအရည်အသွေးကို ပုံမှန်စစ်ဆေးရန် လိုအပ်ပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.2	Some aquaculture practices (such as feeding, fertilizer application, etc.) can contaminate river or other stream water.	Agree, strongly agree, neutral, disagree, strongly disagree	ငါးမွေးမြူရေး အလေ့အထ အချို့ (အစာကျွေးခြင်း၊ ဓါတ်မြေဩဇာ အသုံးပြုခြင်း စသည်ဖြင့်) သည် မြစ် သို့ အခြား ရေချောင်းများကို ညစ်ညမ်းစေ နိုင်ပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.3	Record keeping is important to support the	Agree, strongly agree, neutral, disagree, strongly disagree	စိမ်းလန်း ငါးမွေးမြူရေး အလေ့အထ များကို လက်ခံကျင့်သုံးများ ပံ့ပိုးမှုဖြစ်	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ

	adoption of green aquaculture practices.		စေရန် အချက်အလက်များ သိမ်းထားခြင်းသည် အရေးကြီးပါသည်။	သဘောမတူပါ လုံးဝသဘောမတူပါ
3.4	Improper feeding practices are harmful to the environment.	Agree, strongly agree, neutral, disagree, strongly disagree	စနစ်မကျသည့် အစာကျွေးသည့် အလေ့အထများသည် ပတ်ဝန်းကျင်ကို ထိခိုက်စေနိုင်ပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.5	It is important to avoid prohibited materials (for example dangerous pesticides) even when they are cheaper.	Agree, strongly agree, neutral, disagree, strongly disagree	တားမြစ်ထားသော ပစ္စည်းများ (အန္တရာယ်ရှိသော ပိုးသတ်ဆေးများ) ဈေးသက်သာသော်လည်း ရှောင်ရှားဖို့ အရေးကြီးပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.6	It is important to regularly monitor fish health, not just to increase productivity but also to limit the negative impact of aquaculture to the environment.	Agree, strongly agree, neutral, disagree, strongly disagree	သဘာဝပတ်ဝန်းကျင်နှင့် လိုက်လျောညီထွေစွာ ငါး/ပုစွန်မွေးမြူခြင်းဆိုင်ရာ အလေ့အကျင့် များအတွက် **ငါး/ပုစွန်များ၏ကျန်းမာရေးကို ပုံမှန် စောင့်ကြည့်စစ်ဆေးခြင်းသည် အရေးကြီးသည်။** (ကုန်ထုတ်စွမ်းအားမြှင့်တင်ရန်သာမက ငါးပုစွန်များ၏ ပတ်ဝန်းကျင်အပေါ်	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ

			ဆိုးကျိုးသက်ရောက်မှုများကို ကန့်သတ်ရန်လည်းဖြစ်သည်။)	
3.7	It is important to report disease outbreak to relevant entity.	Agree, strongly agree, neutral, disagree, strongly disagree	ရောဂါများ ပြန့်ပွားသည့်အခါ သက်ဆိုင်သည့်အဖွဲ့အစည်းများကို အစီရင်ခံတင်ပြရန် အလွန်အရေးကြီးပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.8	Checking regularly dissolved oxygen and other water quality parameter should not just be done in your pond, but also in nearby environment.	Agree, strongly agree, neutral, disagree, strongly disagree	အောက်စီဂျင် ပျော်ဝင်မှုနှင့်အခြား ရေအရည်အသွေး အတိုင်းအတာများကို ငါးကန်အတွင်း တွင်သာ မလုပ်ဆောင်သင့်ပဲ အနီးအနား ပတ်ဝန်းကျင်ကိုလဲ ပုံမှန် စစ်ဆေးသင့်ပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
Healthy and well-handled fingerlings, fries or larvae are important in aquaculture. Can you tell me at least 2 indications/criteria of healthy fingerlings, fries, or larvae? **ကျန်းမာပြီးသန်စွမ်းသော ငါးသန် နှင့်သေးငယ်သောငါးသားပေါက် သည် ငါးပုစွန်မွေးမြူရေးတွင်အရေးပါသည်။** ကျန်းမာပြီးသန်စွမ်းသော ငါးသန် နှင့်သေးငယ်သောငါးသားပေါက်များ၏ ညွှန်ပြချက်/စံသတ်မှတ်ချက် **အနည်းဆုံး 2 ခု လောက်** ကို ပြောပြနိုင်မလား။				
3.8	3.8 What are the indicators that show that fingerlings are well handled? Please, indicate at least 2.	The color is bright and shiny	ငါး ကျန်းမာမှု ရှိမရှိကို ပြသသည့် အချက် အနည်း ဆုံး (၂) ချက် ၊ (၂) ချက်ထပ်ပို၍လည်း ရွေးနိုင်ပါတယ်။	အရောင်က တောက်ပ ပြောင်လဲ့နေပါတယ်။

		The body is covered with mucus		ခန္ဓာကိုယ်က အချဲတွေနဲ့ ဖုံးနေပါတယ်။
		Body position is normal		ခန္ဓာကိုယ်အနေအထားက ပုံမှန်ဖြစ်ပါ တယ်။
		There are no dark spots on the body and gills		ခန္ဓာကိုယ်နဲ့ပါးဟက်မှ အမဲစက်များ မရှိ ပါ။
		If held up by the tail, the head shakes vigorously		အမြီးက ကိုင်ပါက ခေါင်းက အားစိုက် ခွန်စိုက် လှုပ်ရှားပါတယ်။
		If you hit the box/bucket that contains them, they will jump or swim upstream and not hang around		ငါးမျိုးပေါက်များထည့်ထားသည့် ရေပုံး / ဗူးကို ရိုက်လိုက်ပါက ငါးများသည် ခုန် ခြင်း သို့ ရေဆန် ကူးခြင်းများ ဖြစ်ပြီး ထို နေရာတွင် မနေတော့ပါ။
		If you stir the water in the bucket containing the hatchlings, the fish will swim upstream and not hang around.		ငါးမျိုးပေါက်များ ထည့်ထားသည့် ရေပုံး ကို မွေလိုက်ပါက ငါးများသည် ရေဆန် ကူးမှာဖြစ်ပြီး ထိုနေရာတွင် မနေတော့ ပါ။
		Don't Know		မသိပါ။
3.9	There are many things we need to pay attention to when feeding the fish/shrimp. Can you tell me at least 2 key	Weather Water colour Health condition (or vitality) of the fish/shrimp	၃.၉ ငါး/ပုဇွန်ကို အစာကျွေးတဲ့အခါ သတိထားရမယ့်အချက်တွေအများကြီးရှိ ပါတယ်။ ၎င်း ထဲမှ အဓိက ထည့်သွင်းစဉ်းစား/စစ်ဆေး/ကြည့်ရှုရန်	ရာသီဥတု ရေအရောင် ငါးကျန်းမာရေးအခြေအနေ (ငါးသန်စွမ်းမှု) ငါး/ပုစွန် အရွယ်အစား အစာ၏ပမာဏ / အလေးချိန်

	things/factors that we need to consider/check/look before feeding fish/shrimp?	Size or age of the fish/shrimp Amount/weight of the feed Quality of the feed Time of the feeding Location of the pond Don't know	လိုအပ်သော အနည်းဆုံး အချက် 2 ခုကို လောက် ပြောပြနိုင်မလား။	အစာ၏အရည်အသွေး အစာကျွေးချိန် အစာကျွေးသည့်နေရာ မသိပါ။
3.10	In aquaculture, what is the ideal temperature of pond water? (degrees Celsius, °C)	20 to 30 degrees Celsius Don't know Other answer, please specify... Other answers, for Pond Water Temperature please specify... Water temperature should be "0" to "100" Degrees Celsius.	၃.၁၀ ရေအရည်အသွေးဆန်းစစ်လေ့ လာရာတွင် **ကန်ရေ၏ သင့်တော်သည့် အပူချိန် သတ်မှတ်ချက် (ဒီဂရီစင်တီဂရိတ်- °C)** ဘယ်လောက်ရှိသင့် ပါသလဲ?	၂၀ မှ ၃၀ ဒီဂရီစင်တီဂရိတ် မသိပါ အခြားအဖြေ များ။ (ရေးပါ) (ကန်ရေ၏ သတ်မှတ် အပူချိန်) အခြားအဖြေ များ ဖြစ်ပါက ကျေးဇူးပြု၍ ဖေါ်ပြပေးပါ။ (ကန်ရေ၏ သတ်မှတ် ရေအပူချိန် မှာ (၀) မှ (၁၀၀) ဒီဂရီ စင်တီဂရိတ် အတွင်း သာ ရှိသင့်ပါတယ်။
3.11	When conducting water quality check, what is the ideal level of water clarity? (in inches)	10 to 14 inches Don't know Other answer, please specify.... Other answer, for water clarity check, please specify...	၃.၁၁ ရေအရည်အသွေးဆန်းစစ်လေ့ လာရာတွင် ကန်ရေ၏ သင့်တော်တဲ့ရေကြည်နှုန်း မှာ (လက်မ) ဘယ်လောက် တွင် ရှိသင့်သလဲ?	၁၀ မှ ၁၄ လက်မ မသိပါ အခြားအဖြေ များ။

		Water Clarity should be "0" to "100" inches.		(ကန်ရေ၏ ရေကြည်နှုန်း) အခြားအဖြေများ ဖြစ်ပါက ကျေးဇူးပြု၍ ဖော်ပြပေးပါ။ (ကန်ရေ၏ ရေကြည်နှုန်း ကို တိုင်းတာရာတွင် (၀) လက်မ မှ (၁၀၀) လက်မ အတွင်းသာ ရှိသင့်ပါတယ်။
3.12	**When conducting water quality check, what is the ideal pH level?**	6.5 to 8.5 Don't know Other answers, please specify: Other Answers, for water quality pH level Water quality pH levels should be "0" to "14".	၃.၁၂ ရေအရည်အသွေးဆန်းစစ်လေ့လာရာတွင် ကန်ရေ၏ သင့်တော်တဲ့ရေချဉ်ဖန်နှုန်း (pH level) ဘယ်လောက်ရှိသင့်သလဲ?	6.5 to 8.5 မသိပါ အခြားအဖြေ များ။ (ရေချဉ်ဖန်နှုန်း pH Level) အခြားအဖြေ များ ဖြစ်ပါက ကျေးဇူးပြု၍ ဖော်ပြပေးပါ။ "ရေချဉ်ဖန်နှုန်း pH Level မှာ "0" to "14" အတွင်းသာ ရှိပါတယ်။"
3.13	**When conducting water quality check, what is the ideal level of dissolved oxygen? (mg/l)**	4-8 mg/l or more Don't know Other answer, please specify: Other Answer, for water quality dissolved oxygen level. (mg/L) Water quality dissolved oxygen levels should be "1" to "10".	၃.၁၃ ငါးပုဇွန် ကန် ၏ ရေအရည်အသွေးဆန်းစစ်လေ့လာရာမှာ ၊ **(ရေတစ်လီတာတွင် ရှိသင့်သည့် ပျော်ဝင်နေသည့်အောက်ဆီဂျင်ပမာဏ** (mg/l) ဘယ်လောက်ရှိ သင့်ပါသလဲ?	4-8 mg/l မသိပါ အခြားအဖြေ များ။ (ရေတစ်လီတာတွင် ရှိသင့်သည် ပျော်ဝင်နေသည့်အောက်ဆီဂျင်ပမာဏ) အခြားအဖြေ များ ဖြစ်ပါက ကျေးဇူးပြု၍ ဖော်ပြပေးပါ။ ရေတစ်လီတာတွင် ရှိသင့်သည် ပျော်ဝင်နေသည့်အောက်ဆီဂျင်ပမဏ

				မှာ "1" to "10" အတွင်းသာ ရှိသင့်ပါတယ်။ (mg/L)
GAK – Additional Questions (Park 2)				
3.14	**IF the water temperature is rising and the fish are not active; THEN we need to reduce feed by 40-50% or not providing feed in the morning and the evening feed can be provided late at night at 10-11 PM.**	Agree, strongly agree, neutral, disagree, strongly disagree	**ရေအပူချိန်မြင့်တက်လာပြီး ငါးများတက်ကြွမှုမရှိပါက** ကျွေးမည့် အစာ၏ ၄၀-၅၀% လျော့ကျွေးခြင်း (သို့) မနက်ပိုင်းတွင် အစာမကျွေးခြင်းပြုလုပ်ခြင်း၊ ညနေပိုင်းအစာကို ညဘက် ၁၀-၁၁နာရီ နောက်ကျမှကျွေးခြင်း ပြုလုပ်ရန်လိုအပ်ပါသည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.15	**IF fish/shrimps are inactive or death, it may be due to poor pond water conditions and disease; THEN we should reduce the feed quantity and feeding frequency.**	Agree, strongly agree, neutral, disagree, strongly disagree	ငါးများပုံမှန်ကူးခတ်သွားလာမှုမရှိခြင်း (သို့) ငါးသေခြင်း သည် ကန်ရေအခြေနေမကောင်းခြင်း နှင့် ရောဂါ ကျရောက်ခြင်းကြောင့်ဖြစ်နိုင်သည်။ ထို့ကြောင့် အစာကျွေးနှုန်းကိုလျော့ချရပါမည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
3.16	**IF the feed you are going to use is moldy; THEN we should not use it.**	Agree, strongly agree, neutral, disagree, strongly disagree	အကယ်၍ မိမိအသုံးပြုမည့် ငါးစာတွင် မှိုတက်နေပါက အသုံးမပြုသင့်ပါ။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ

				လုံးဝသဘောမတူပါ
3.17	**IF we want to increase productvity and environmental sustainability of our aquaculture; THEN it is important to calculate feed convertion ratio (FCR) in our aquaculture operation.**	Agree, strongly agree, neutral, disagree, strongly disagree	အကယ်၍ ငါးပုစွန်များ၏ ကုန်ထုတ်စွမ်းအားနှင့် သဘာဝပတ်ဝန်းကျင် ရေရှည်တည်တံ့မှုကို တိုးမြှင့်လိုလျှင်၊ ငါးအစာကျွေးရမည့်ပမာဏ **(FCR) တွက်ချက်ပြီးကျွေးခြင်း**(ငါးကန်အတွင်းရှိ ငါးအလေးချိန်၏ ရာခိုင်နှုန်းပေါ်တွင်မူတည်၍ကျွေးရမည့် ပမာဏကိုတွက် ချက်ခြင်း) သည် ငါးမွေးမြူရေးအတွက် အဓိကကျသောလုပ်ဆောင်ချက်ဖြစ်သည်။	သဘောတူပါတယ် လေးလေးနက်နက် သဘောတူပါတယ် ကြားနေ သဘောမတူပါ လုံးဝသဘောမတူပါ
Section (4) No. of MSMEs that take adaptive actions to reduce water pollution caused by aquaculture, in response to data on water quality generated by the action & environmental screening checklists completed by champion MSMEs				
Adaptive action using DATA				
4.1	Have you received any data/information from the NGA program on water quality parameters?	Yes, No	ငါး မြန်မာ စီမံကိန်းမှ ပေးသည့် ရေအရည်အသွေး သတ်မှတ်ချက် အတိုင်း အတာ အချက်အလက်များကို သင် လက်ခံရရှိဖူးပါသလား။	ရရှိဖူးပါတယ် မရရှိဖူးပါ
4.2	IF YES, did you take any adaptive actions to reduce		ရရှိဖူးပါက ငါးမွေးမြူခြင်းကြောင့် ဖြစ်ပေါ်သည့် ရေ ညစ်ညမ်းမှုကို	လက်ခံကျင့်သုံးခဲ့ပါတယ်။ မကျင့်သုံးခဲ့ပါ။

	water pollution caused by aquaculture, in response to the data/information provided by the NGA program?		လျော့ချရန် ငါးမြန်မာ စီမံကိန်းမှ ပေးသည့် အချက်အလက်များ သုံးပြီး လက်ခံ ကျင့်သုံးမှုများ ပြုလုပ်ခဲ့ပါ သလား။	
The end				

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About Mercy Corps

Mercy Corps is a leading global organization powered by the belief that a better world is possible. In disaster, in hardship, in more than 40 countries around the world, we partner to put bold solutions into action — helping people triumph over adversity and build stronger communities from within. Now, and for the future.

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