Barrier Analysis for Designing Behavior Change Strategies

Improving the Adoption of Water Quality Monitoring Practices in Aquaculture

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Introduction

Mercy Corps Netherlands (MCN), in collaboration with Village Link (VL), a technology company, and Daung Capital (DC), a financial institution, is at the forefront of implementing the Nurturing Green Aquaculture in Myanmar (NGA-Myanmar) programme in the Yangon-Ayeyarwady aquaculture corridor. This initiative, generously funded by the European Union (EU), aims to bolster micro, small, and medium enterprises (MSMEs) involved in fish production, with a particular focus on fish/shrimp farming households. The programme is dedicated to facilitating access to and the adoption of cleaner production practices and green technologies.

By leveraging the expertise of Village Link and the financial support from Daung Capital, NGA-Myanmar is pioneering the integration of innovative solutions. These include the establishment of micro circular economies designed to return nutrients to the ecosystem. Additionally, the programme emphasizes the application of smart devices and lower-end green technologies. The overarching goal is to empower the target MSMEs to enhance productivity and implement efficient waste management practices. This, in turn, contributes to the reduction of water pollution and carbon emissions within the Ayeyarwady delta ecosystem.

As part of the programme's Monitoring, Evaluation, and Learning (MEL) framework, a Barrier Analysis is conducted during the biannual survey carried out by the MEL team towards the end of the second year of the programme, specifically in December 2023. This analytical endeavour is aimed at identifying key behaviour determinants that influence the adoption of practices by individual aquaculture operators. The central research question guiding this analysis is: "*What are the barriers and levers for the adoption of water quality monitoring by aquaculture producers in NGA-Myanmar target locations?*"

Recognizing the critical role that water quality plays in both productivity and environmental impact, the programme team, in collaboration with dedicated champions, has identified key water quality parameters, presented below. Each parameter plays a specific role in influencing the health and productivity of aquatic environments. The targeted focus on these parameters underscores the programme's commitment to ensuring sustainable practices that benefit both the aquaculture industry and the delicate ecosystem in which it operates. The findings from this analysis are expected to provide actionable insights and recommendations for the programme team, allowing them to design strategies that effectively address the identified barriers.

Table 1: NGA-Myanmar Key Water Quality Parameters and Their Significance and Importance

Parameter	Significance	Importance
Ammonia	It is a nitrogen compound that is a natural by-product of fish waste and decaying organic matter in aquaculture systems.	Elevated levels of ammonia can be toxic to aquatic organisms, especially fish. Monitoring ammonia levels is vital to prevent adverse effects on fish health and ensure a safe environment for aquaculture operations.
pH (Acidity/Alkalinity)	It measures the acidity or alkalinity of water and influences the solubility of minerals, nutrient availability, and the effectiveness of biological processes.	Fish and other aquatic organisms have specific pH range tolerances. Deviations from the optimal pH range can stress or harm aquatic life, affecting their growth, reproduction, and overall well-being.
Temperature	It directly affects the metabolic rates of aquatic organisms, including fish, and influences various physiological processes.	Different fish species thrive within specific temperature ranges. Monitoring and maintaining appropriate water temperatures are crucial for promoting optimal growth, reproduction, and overall health of the aquatic species being cultivated.

Parameter	Significance	Importance
Colour	It indicates the presence of suspended particles, algae, or other substances in the water.	Abnormal coloration may signal issues such as algal blooms, sedimentation, or the presence of pollutants. Monitoring color helps assess water quality and identify potential problems that could impact the health of aquatic organisms.
Transparency	Water clarity measures the extent to which light can penetrate the water column.	Adequate transparency is essential for the growth of aquatic plants and the well-being of fish. Low transparency may indicate high turbidity or the presence of suspended particles, affecting light penetration and, consequently, photosynthesis and visibility for aquatic organisms.

Methodology

Method

Barrier analysis is widely employed in public health to systematically address challenges and enhance the likelihood of success in achieving behavior change. It serves as a valuable tool for designing interventions that target specific behaviors. The process involves systematically identifying and analyzing obstacles or barriers that may impede the desired behavior, enabling the development of targeted strategies to overcome these challenges.

A Doer/Non-Doer Analysis is used as a specialized form of barrier analysis that categorizes individuals or entities based on their engagement in specific behaviors related to a particular goal or objective. This analysis distinguishes between those actively involved in desired behaviors (**Doers**) and those not participating or engaging as expected (**Non-Doers**). This approach is commonly employed to understand and address obstacles to goal attainment.

Description of the Behaviours

To conduct a Barrier Analysis, the research team begins by clearly defining the behaviours under investigation. This initial step establishes a robust foundation for subsequent analysis, providing a clear understanding of the desired outcomes. The behaviour statement is developed based on key water monitoring practices expected to be delivered by the NGA-Myanmar target participants on a regular basis.

The behaviour statement is:

*"Aquaculture operators deliver **at least three** of the following practices:*

- *Measuring **ammonia** level at pond at least twice a month,*
- *Measuring **pH** level at pond at least once a week,*
- *Measuring **temperature** level at pond every day,*
- *Checking the **colour of the water (visual observation)** of the pond at least once a week,*
- *Checking the **transparency of the water** (using Secchi disc or hand) of the pond at least once a week."*

Priority Groups

The programme's priority groups are programme participants categorized as "champions". They are aquaculture operators, mostly fish/shrimp producers, who are actively engage in the programme technical trainings and demonstration as well as other activities to support adoption the promoted green aquaculture practices. NGA-Myanmar targets 250 champions who are expected to perform the promoted behaviours. Through these champions, other aquaculture producers (those categorized by NGA-Myanmar as "early adopters", with a target of additional 2,000 participants) are expected to adopt the promoted practices through peer-to-peer extension system.

Behaviour Determinants

After delineating the research goals, the next crucial step involves a thorough examination of behaviour determinants among program participants. Employing

survey interviews as a methodological tool, the research team systematically categorizes participants into two distinct groups: 'Doers' and 'Non-Doers.' 'Doers' are defined as individuals actively engaged in a commendable level of adherence, participating in at least three of the five desired behaviours outlined in the behaviour statement. Conversely, 'Non-Doers' are those participants who do not meet the expected level of engagement, practicing fewer than three of the desired behaviours.

Through targeted survey interviews tailored to each group, the research team aims to delve into the intricacies of the 12 behaviour determinants. The objective is to uncover and discern significant differences in these determinants between the 'Doers' and 'Non-Doers' categories. This comprehensive approach allows for a nuanced understanding of the factors influencing behaviour, contributing valuable insights to the design of effective intervention strategies.

The 12 behaviour determinants under examination encompass a wide spectrum of influences, ranging from individual beliefs and perceptions to external factors such as policy and cultural norms. As the research team navigates through the survey interviews specific to both groups, the focus is on identifying variations and patterns within these determinants. Key areas of investigation include perceived self-efficacy/skills, social norms, positive and negative consequences, access to resources, cues for action, perceived susceptibility/risk, perceived severity, perceived action efficacy, perceived divine will, policy impact, and cultural influences.

- **Perceived self-efficacy/skills**: An individual's belief in their ability to perform specific behaviours, considering skills and knowledge.
- **Perceived social norms**: The perception of important individuals endorsing specific behaviours.
- **Perceived positive consequences**: Anticipation of positive outcomes resulting from the behaviours.
- **Perceived negative consequences**: Anticipation of negative outcomes resulting from the behaviours.
- **Access**: Availability and accessibility of products or services required for behaviours adoption.
- **Cues for action/reminders**: Presence of reminders facilitating behaviours recall.
- **Perceived susceptibility/risk**: Individual perception of vulnerability or risk related to the behaviours.
- **Perceived severity**: Belief in the seriousness of the problem the behaviours address.
- **Perceived action efficacy**: Belief that the behaviours effectively prevent the identified problem.
- **Perceived divine will**: Belief in divine influence on behaviours and outcomes.
- **Policy**: Impact of laws and regulations on behaviours and access to products and services.
- **Culture**: Influence of history, customs, and values on perceived social norms.

By scrutinizing the responses of 'Doers' and 'Non-Doers' through the lens of these behaviour determinants, the research team seeks to pinpoint the critical factors that contribute to engagement or non-engagement. This methodological approach not only highlights the diversity in participant responses but also enables the identification of key leverage points for intervention. The ultimate goal is to inform the development of targeted strategies that address the specific barriers hindering behaviour change among 'Non-Doers' and reinforce positive influencers among 'Doers.' This research methodology thus acts as a powerful tool in crafting evidence-based interventions that resonate with the unique dynamics of the participant population.

Limitations

The application of Barrier Analysis, a methodology traditionally entrenched in the nutrition and health sectors, in the context of livelihood development, as exemplified by the NGA-Myanmar program, introduces unique challenges. The inherent complexity of the promoted behaviours within the livelihood sector necessitates a meticulous approach to crafting behaviour statements. Unlike more straightforward behaviours commonly targeted in health-related analyses, livelihood practices often involve intricate, multifaceted processes. Balancing the need for detailed behaviour statements with the requirement for specific and analysable data poses a distinct challenge, requiring a nuanced approach to ensure the methodology aligns with the complexities of the behaviours under investigation.

Furthermore, the conventional approach to Barrier Analysis involves a comparison between responses from 40 ‘Doers’ and 40 ‘Non-Doers’. However, in the context of the NGA-Myanmar program, the number of

participants transcends this traditional framework. The expansive scope, as revealed by the results from the survey, challenges the conventional methodology. This necessitates adaptability in the analytical framework to effectively incorporate the larger participant pool, ensuring that the analysis remains representative and valid despite deviations from the standard sample size.

Compounding these challenges, the prevailing security landscape prompted a shift in the data collection methodology. Conducting interviews via phone survey became imperative, introducing an additional layer of complexity. The inherent limitations of remote communication, including potential misinterpretations and the absence of visual cues, accentuate the need for meticulous training of enumerators. Recognizing the significance of their role in accurate data collection, enumerators underwent specific training tailored to Barrier Analysis data collection. Furthermore, daily quality assurance checks were systematically implemented to validate the accuracy and comprehensiveness of the collected data. These measures aimed to mitigate potential pitfalls associated with remote interviewing and maintain the integrity of the Barrier Analysis methodology.

Respondents Information

'Doers' and 'Non-Doers'

The respondents in this study are participants of the NGA-Myanmar program, specifically categorized as "champions." Out of the 314 champions actively involved in program activities, 210 participants were successfully reached for the survey, and the analysis focused on data from 196 respondents. The exclusion of 14 respondents from the analysis was due to non-response to certain survey questions.

Table 3 and Table 4 present a breakdown of respondents into 'Doers' and 'Non-Doers' across all townships, shedding light on the prevalence of desired behaviours in different locations. The data reveals that out of the total 196 respondents, 74 (accounted for 38%) are classified as 'Doers,' actively practicing at least 3 out 5 the recommended behaviours.

Maubin, Nyaungdon, and Twantay show varying degrees of 'Doer' engagement, while Pantanaw exhibits a notably low percentage. Conversely, 'Non-Doers' account for 122 respondents (62%), demonstrating a portion of the participants that has not yet embraced the targeted behaviours. The percentage breakdown in Table 4 further emphasizes the disparities, with Maubin presenting the highest 'Doer' percentage, and Pantanaw the lowest.

Table 2: Number of Respondents

	All	Maubin	Nyaungdon	Pantanaw	Twantay
Interviewed respondents	210	92	55	11	52
Removed due to no response	14	6	4	0	4
Used for data analysis	196	86	51	11	48

Table 3: Number of Respondents Based on 'Doers' and 'Non-Doers'

	All	Maubin	Nyaungdon	Pantanaw	Twantay
Doers	74	29	24	2	19
Non-Doers	122	57	27	9	29
All	196	86	51	11	48

Table 4: Percentage of Respondents Based on 'Doers' and 'Non-Doers'

	All	Maubin	Nyaungdon	Pantanaw	Twantay
Doers	38%	15%	12%	1%	10%

Non-Doers	62%	29%	14%	5%	15%
All	100%	44%	26%	6%	24%

Water Monitoring Practices

The breakdown of respondents based on the type of water quality parameters they regularly monitor, as outlined in the assessed behaviour statement, is presented in the following Table 5 and Table 6. Among the five parameters studied, the most widely practiced behaviour is "Checking the colour of the water (visual observation) of the pond at least once a week," with 176 participants (accounting for 90% of respondents) reporting regular engagement in this practice. Following closely is the behaviour of "Checking the transparency of the water (using Secchi disc or hand) of the pond at least once a week," reported by 127 respondents (65%).

Meanwhile, "Measuring temperature level at the pond every day" and "Measuring pH level at the pond at least once a week" are practiced by 30% of respondents each. Notably, "Measuring ammonia level at the pond at least twice a month" emerges as the least popular practice, undertaken by only 15% of participants. This lower engagement could be attributed to the perceived complexity of delivering ammonia tests compared to other monitoring practices.

Moving beyond mere categorization, Table 7 delves into the number of recommended practices adopted by respondents. A nuanced analysis reveals that 18 respondents have yet to adopt any of the prescribed practices. Meanwhile, a substantial portion, 70 respondents, have incorporated two practices, indicating a moderate level of adherence. The distribution varies across townships, with Maubin exhibiting a higher percentage of respondents implementing recommended practices, and Pantanaw showcasing a lower adoption rate.

Table 8 refines the analysis by presenting the percentage of respondents implementing recommended practices based on the number of practices adopted. The breakdown reveals that 9% of respondents have yet to adopt any practices, while 17% have embraced a single practice. The figures provide a comprehensive understanding of the varying degrees of adherence across the surveyed locations, offering valuable insights for targeted intervention strategies.

Table 5: Number of Respondents Implementing Recommended Practices Based on Studied Parameters

Parameter	All	Maubin	Nyaungdon	Pantanaw	Twantay
Ammonia	30	9	12	0	9
PH	58	22	15	3	18
Temperature	59	21	25	1	12
Colour	176	74	50	9	43
Clarity	127	59	37	5	26

Table 6: Percentage of Respondents Implementing Recommended Practices Based on Studied Parameters

Parameter	All	Maubin	Nyaungdon	Pantanaw	Twantay
Ammonia	15%	5%	6%	0%	5%
PH	30%	11%	8%	2%	9%
Temperature	30%	11%	13%	1%	6%
Colour	90%	38%	26%	5%	22%
Clarity	65%	30%	19%	3%	13%

Table 7: Number of Respondents Implementing Recommended Practices Based on the Number of Practices

# Adopted Practice	All	Maubin	Nyaungdon	Pantanaw	Twantay
None	18	12	0	2	4
1 practice	34	11	6	3	14

2 practices	70	34	21	4	11
3 practices	36	15	12	1	8
4 practices	22	9	5	1	7
All practices	16	5	7	0	4

Table 8: Percentage of Respondents Implementing Recommended Practices Based on the Number of Practices

Parameter	All	Maubin	Nyaungdon	Pantanaw	Twantay
None	9%	6%	0%	1%	2%
1 practice	17%	6%	3%	2%	7%
2 practices	36%	17%	11%	2%	6%
3 practices	18%	8%	6%	1%	4%
4 practices	11%	5%	3%	1%	4%
All practices	8%	3%	4%	0%	2%

Behaviour Determinant Analysis

In our endeavour to understand the dynamics influencing participant adoption of promoted practices within the NGA-Myanmar program, a meticulous examination of key behaviour determinants was conducted. The focal point of this analysis is the comparison between responses from two distinct groups: the proactive 'Doers' and the less engaged 'Non-Doers.' The objective is to identify responses deemed as key determinants that drive respondent adoption of the promoted practices outlined in the behaviour statement.

Table 9, which encapsulates the essence of this comparative analysis, unveils crucial insights into the mindset of both 'doers' and 'non-doers.' Each determinant is scrutinized, and the responses provided by the two groups are juxtaposed to reveal substantial differences, denoted as the 'Diff' column. To ascertain significance, a threshold of +/-15% or more is employed, providing a nuanced understanding of the determinants that exert a substantial influence on behaviour adoption.

The analysis reveals the following key determinants with significant Differences:

1. Perceived Self-Efficacy/Skills:
   - 'Doer' Response (42%): "Because I know how to do the practices, they are easy to do."
   - 'Non-Doer' Response (13%): "Because I don't know how to do the practices."
   - Significance (29%): The contrast in responses underscores the pivotal role of perceived self-efficacy and skills in driving adoption, with 'Doers' expressing confidence in their abilities compared to 'Non-Doers.'

2. Perceived Positive Consequences:
   - 'Doer' Response (66%): "Because those practices are good for the fish/shrimp."
   - 'Non-Doer' Response (28%): "Because those practices are not so good for the fish/shrimp."
   - Significance (38%): The substantial gap suggests a profound influence of the belief in positive consequences on 'Doers,' motivating them to engage in the practices.

3. Access:
   - 'Doer' Response (41%): "Because I have the tools/test-kits to do those practices."
   - 'Non-Doer' Response (8%): "Because I don't have the tools/test-kits to do those practices."
   - Significance (32%): The notable difference emphasizes the critical role of access to tools and resources, with 'Doers' having the necessary equipment compared to 'Non-Doers.'

4. Perceived Susceptibility/Risk:
   - 'Doer' Response (20%): "Because I am afraid of pest/disease attack."

- 'Non-Doer' Response (3%): "Because I am not afraid of pest/disease attack, or nothing to worry."
- Significance (17%): The substantial variation underscores the impact of perceived susceptibility or risk on 'Doers,' who express fear of potential issues, compared to 'Non-Doers.'

In conclusion, these four determinants emerge as key influencers with significant differences between 'Doers' and 'Non-Doers,' shedding light on the psychological, practical, and risk-related factors that drive engagement in the promoted practices. Recognizing these distinctions is instrumental in tailoring interventions that specifically target and address the unique considerations of each group, ultimately enhancing the efficacy of behaviour change strategies within the NGA-Myanmar program.

Table 9: Respondent Response Analysis

Key Determinant & Related Respondent Statements	Doers	Non-Doers	Diff	Remark
Perceived self-efficacy/skills				
Because I know how to do the practices, they are easy to do	42%	13%	29%	Significant
Because I don't know how to do the practices	22%	41%	-20%	Significant
Perceived social norms				
Because other farmers do the practices	3%	3%	-1%	Not significant
Because other farmers don't do the practices	3%	8%	-5%	Not significant
Perceived positive consequences				
Because those practices are good for the fish/shrimp	66%	28%	38%	Significant
Perceived negative consequences				
Because those practices are bad for the fish/shrimp	0%	1%	-1%	Not significant
Access				
Because I have the tools/test-kits to do those practices	41%	8%	32%	Significant
Because I don't have the tools/test-kits to do those practices	3%	5%	-2%	Not significant
Time constraints	9%	10%	0%	Not significant
Perceived cues for action/reminders				
Because someone remind me to do those practices	12%	8%	4%	Not significant
Because I always forget, or no one remind me to do those practices	20%	24%	-4%	Not significant
Perceived susceptibility/risk				
Because I am afraid of pest/disease attack	20%	3%	17%	Significant
Because I am not afraid of pest/disease attack, or nothing to worry	0%	21%	-21%	Significant
Perceived severity				
Because if I don't figure out any problem early, the problem can be big	19%	8%	11%	Not significant

Key Determinant & Related Respondent Statements	Doers	Non-Doers	Diff	Remark
Because if I don't figure out any problem early, the problem can be easily handled	0%	0%	0%	Not significant
Perceived action efficacy				
Because by doing those practices I can avoid any potential problem	14%	2%	12%	Not significant
Because by I don't trust that they are useful	0%	2%	-2%	Not significant
Perceived divine will				
Because it's suggested by the religion	0%	0%	0%	Not significant
Because religion prohibits me to do those practices	0%	0%	0%	Not significant
Policy				
Because government/policy required me to do those practices	1%	0%	1%	Not significant
Because government/policy do not require me to do those practices	0%	0%	0%	Not significant
Culture				
Because it is a cultural thing in this community	3%	3%	-1%	Not significant
Because it is part of the culture in this community of not doing those practices	4%	4%	0%	Not significant

Designing Behaviour Change (DBC) Strategy

What is DBC?

As previously outlined, the Doers/Non-Doers Barrier Analysis identifies the obstacles or challenges that NGA-Myanmar target participants encounter in adopting the promoted practices. This analysis distinguishes between those who are already performing the desired behaviour (Doers) and those who are not (Non-Doers). Specifically, the analysis identifies key behaviour determinants that can be utilised by the programme team to adapt relevant interventions to address the identified obstacles and promote behaviour change. The use of the Designing Behaviour Change (DBC) framework is instrumental in developing these strategies.

Designing Behaviour Change (DBC) is a comprehensive framework that encompasses various strategies and approaches to positively influence and modify human behaviour. It involves the systematic development of interventions informed by key determinants identified in the Barrier Analysis. The relationship between Doers/Non-Doers Barrier Analysis and DBC lies in the fact that the insights gained from the barrier analysis directly inform the design of effective behaviour change interventions. The barriers identified among Non-Doers become the focal points for intervention strategies, aiming to overcome these obstacles and facilitate the adoption of the desired behaviour.

In the DBC framework, understanding the motivations, perceptions, and contextual factors that contribute to the identified barriers is crucial. Additionally, DBC emphasises the importance of tailoring interventions to specific target populations, recognising that different groups may face unique barriers and respond differently to intervention strategies. By combining the insights from Doers/Non-Doers Barrier Analysis with the principles of DBC, the programme team can create targeted and evidence-based interventions that

address the root causes of non-adherence to the desired practices. This integrated approach enhances the effectiveness of behaviour change initiatives, promoting sustainable and positive shifts in individual and community behaviour.

DBC framework

A DBC Framework comprises the following elements:

Behavior: In the DBC Framework, behavior denotes a specific action undertaken by members of the priority group to tackle a prevailing issue. Often termed as "practices," these behaviors become habitual through consistent repetition. Behavior statements are crafted in positive, present tense, specifying who is responsible for executing the behavior or ensuring its implementation (especially in the case of children). They provide detailed information such as the location (e.g., health clinic), quantity (e.g., meal portions), frequency (e.g., application of fertilizer), and duration (e.g., duration of breastfeeding). These statements must be highly specific, measurable, and observable.

Priority group: This refers to the cohort encouraged to adopt the behavior, including those responsible for ensuring adherence (e.g., caregivers of infants). While typically belonging to the target audience (e.g., mothers of children under 5), the DBC Framework can extend to service providers, including employees or volunteers (e.g., extension agents, health promoters). The Priority Group is delineated in six different facets, aiding in the planning of tailored and effective program interventions.

Influencing group: This group exerts the most influence on the priority group regarding the targeted behavior. Formative research conducted with the priority group identifies the influencing group, usually limited to one or two entities. If their influence is substantial, they should also be described across six dimensions.

Determinants: These represent the categories of factors influencing whether the priority group adopts a specific behavior. Formative research, such as Doer/Non-Doer Studies or Barrier Analysis, identifies the most significant determinants.

Bridges to activities: Derived from formative research responses, these are detailed prescriptions for addressing identified issues. Bridges to activities typically start with a directional verb (e.g., increase, decrease, improve, reinforce) and aim to alter the perception of the priority group. Each important determinant warrants at least one bridge to activity, focusing on the priority group without explicit mention.

Activities: These are a sequence of tasks planned, organized, and executed by program implementers, often involving the priority or influencing groups to address bridges to activities. Activity descriptions commence with an action verb and are designed to effect change. For instance, "offer a small loan to one entrepreneur per village to produce and sell quality, affordable chicken feed" or "set up additional sale points of wire mesh."

Accordingly, the DBC framework is established and presented in the Table 9, based on the results of the Barrier Analysis.

Recommended Activities

The following activities are recommended to improve the adoption of the promoted behaviours.

Refresher Training Sessions:
Conducting refresher training sessions tailored to participants is essential for enhancing their proficiency in water quality monitoring techniques. These sessions are designed to refresh participants' knowledge and skills, ensuring they gain sufficient knowledge and skills in monitoring water quality parameters. By focusing on effective techniques specific to their needs, participants can gain confidence and competence in carrying out accurate assessments of water quality in aquaculture settings. The tailored approach of these sessions allows for personalized guidance and support, addressing any challenges or areas for improvement identified by participants.

Utilizing Various Communication Channels:
To maximize outreach and engagement, various communication channels are utilized to disseminate information about the significance of water in aquaculture operations and the associated risks of pest and disease outbreaks due to poor water quality. Posters serve as visual aids to convey key messages, while online platforms such as Facebook Pages and the Htwet Toe app provide accessible platforms for information sharing and community engagement. Additionally, field day events offer interactive opportunities for stakeholders to learn firsthand about the importance of water quality management and its impact on aquaculture productivity. By utilizing a

diverse range of communication channels, the message reaches a wider audience and fosters greater awareness and understanding of the critical role of water quality in aquaculture.

Developing Markets for Water Quality Test-kits:
Providing support to private sector actors involves facilitating the marketing of high-quality tools and test-kits to aquaculture practitioners. By partnering with private sector entities, aquaculture practitioners gain access to reliable and innovative tools essential for monitoring and maintaining water quality in their operations. This support not only ensures the availability of necessary resources but also promotes the adoption of advanced technologies and practices that contribute to improved productivity and sustainability in aquaculture. By empowering private sector actors to market high-quality tools and test-kits, the aquaculture industry is strengthened, fostering growth and resilience within the sector.

Table 10: The DBC Framework

Behaviour	Priority & Influencing Groups	Determinants	Bridges to Activities	Activities
Aquaculture operators deliver at least three of the following practices: • Measuring ammonia level at pond at least twice a month, • Measuring pH level at pond at least once a week, • Measuring temperature level at pond every day, • Checking the colour of the water (visual observation) of the pond at least once a week, • Checking the transparency of the water (using Secchi disc or hand) of the pond at least once a week.	**Priority Group**: Family members, male or female, of aquaculture farming households who has responsibility to manage their aquaculture farming. **Influencing Group**: Local informal leaders, especially those considered by others as knowledgeable persons.	**Perceived Self-Efficacy/Skills**: • Know-how on how to measure different water quality parameters. **Perceived Positive Consequences**: • Monitoring water quality parameters help them to manage the fishpond. **Access**: • Ability to access the required tools/test-kits to do those practices. **Perceived Susceptibility/Risk**: • Afraid of pest/disease attack	• Enhance proficiency in measuring water quality parameters. • Reinforce the understanding of water's crucial role in aquaculture production success. • Improve aquaculture households' access to appropriate tools and test-kits. • Emphasize the risk of pest and disease outbreaks resulting from inadequate water quality parameters.	1) Conduct refresher training sessions tailored to participants, focusing on effective water quality monitoring techniques. 2) Utilize various communication channels such as posters, online aquaculture communities on platforms like Facebook Pages and Htwet Toe app, as well as field day events to: • Highlight the significance of water in aquaculture operations. • Raise awareness about the potential risks associated with pest and disease outbreaks due to poor water quality. 3) Provide support to private sector actors to facilitate the marketing of high-quality tools and test-kits to aquaculture practitioners.

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