



Fish for Livelihoods

Barrier analysis study

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Fish for Livelihoods

Capture fisheries are declining in Myanmar, yet 60% of the population's animal-source food is fish. To meet the growing demand for fish, aquaculture production in the country is increasing. It is essential that Myanmar develops a sustainable aquaculture industry that minimizes potential environmental impacts and ensures aquaculture practices are socially acceptable and economically sound. To this end, the United States Agency for International Development (USAID) funded the Fish for Livelihoods (F4L) *Activity* with the aim of increasing fish production, labor productivity, food availability and fish consumption, especially for women and children from vulnerable households. It provides opportunities for entrepreneurial activities in small-scale aquaculture systems and promotes social behavioral change messages that direct home production and market purchases toward nutritious-conscious household decisions.

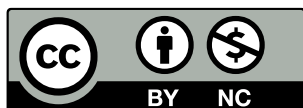
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List of abbreviations

AP	aquaculture promoters
BA	barrier analysis
BAPs	best aquaculture practices
CF	community facilitators
DBC	Designing for Behavior Change (framework)
F4L	Fish for Livelihoods (<i>Activity</i>)
IEC	information, education and communication
IP	implementing partners
MDD-W	Minimum Dietary Diversity for Women
SIS	small indigenous fish species
SSA	small-scale aquaculture
U5	children under 5 years old
USAID	United States Agency for International Development
WASH	water, sanitation and hygiene
WRA	women of reproductive age

1. Executive summary

Malnutrition remains a significant problem in Myanmar, mostly among children under 5 years old (U5) and women of reproductive age (WRA) (MOHS 2018). And because of the COVID-19 pandemic and the recent political crisis that has hit the country, the problem is expected to get worse. Poverty and food insecurity are increasing, especially among poor households (MAPSA 2021), and at least 50% of households in Myanmar have not achieved the minimum level of food diversity (MOHS 2018). This is alarming because poor diet diversity, which is one of the underlying causes of malnutrition, results in nutrient gaps that have negative health consequences on young children and WRA.

To meet this challenge, the United States Agency for International Development (USAID) awarded the Fish for Livelihoods (F4L) *Activity*¹ to WorldFish. The *Activity*, which runs from 2019 to 2024, is being implemented in Magway, Sagaing, Mandalay, Kachin, Eastern and Southern Shan in Myanmar.

The aim of the *Activity* is to increase income and improve nutrition among rural households. There are three main components: (1) increase production through innovative small-scale aquaculture (SSA) technologies, (2) increase the use of market systems approaches, and (3) improve human nutrition and water, sanitation and hygiene (WASH) practices through social behavior change communication activities.

One year into the implementation of *Activity* interventions, findings from a baseline survey, regular monitoring and feedback from implementing partners (IPs) revealed two main challenges: (1) women lack sufficient knowledge regarding consumption of diverse food and have poor diet diversity, and (2) SSA farmers struggle to adhere to good practices in aquaculture technologies. To address these challenges, a better understanding of the context was required, so a barrier analysis² (BA) was conducted following the Designing for Behavior Change (DBC) framework.³ The results were then applied to the framework to identify key activities.

The following two behaviors were selected for the BA:

- Behavior 1: Mothers of U5 consume at least five out of 10 food groups every day, as identified in the Minimum Dietary Diversity for Women Guidelines (MDD-W).⁴
- Behavior 2: SSA farmers of the F4L *Activity* stock their homestead ponds with 3500–5000 fish fingerlings (3–5 inches long) per acre in every production cycle.

1.1. Method

BA is a rapid assessment tool used to better understand how to successfully promote behaviors by identifying the most significant barriers and motivators to adopting a specific behavior by priority groups, in this case mothers of U5 and SSA farmers. For this study, the BA required a total of 90 respondents for each behavior in each township: 45 “Doers” and 45 “Non-Doers.” Doers were those who practiced the behavior while Non-Doers were those who did not. Townships were selected based on the poorest performance for each behavior as per baseline findings: Khin U Township for Behavior 1⁵ and Salin and Taunggyi townships for Behavior 2. Data collection took place July 7–12, 2021.

¹ The term *Activity* is now used by USAID in lieu of Project.

² https://pdf.usaid.gov/pdf_docs/PA00JMZW.pdf

³ DBC framework consists of the behavior statement; description of the priority group; and selection of determinants, bridges to activities, and activities.

⁴ Food and Agriculture Organization & FHI360. 2016. Minimum Dietary Diversity for Women (MDD-W): A guide to measurement. FANTA III.

⁵ Pekhon Township was also selected but could not be included because of the military conflict.

1.2. Significant findings

For Behavior 1, mothers were encouraged to consume diverse foods because they are delicious and make them feel strong and energetic. However, a lack of time and money were considered barriers to practicing the behavior. Moreover, mothers also mentioned that eating diverse foods makes them feel dizzy and nauseous, something that needs to be explored further. Surprisingly, mothers identified their sister as a key influencer who discouraged practicing the behavior. Lastly, about half the respondents believed that nutritional problems, such as anemia, are a result of bad karma.⁶

For Behavior 2, the main enablers among the selected SSA farmers were high fish survival rate, knowledge of good fish stocking practices, increased income, and ease of access to fresh fish for consumption. Factors that deterred farmers from applying good practices included perceptions about additional costs to implement good practices, losing fish to theft, lack of access to good quality fish fingerlings, and predatory fish, snakes and birds eating their fish. SSA farmers identified grandfathers and mothers as primary influencers of the behavior.

1.3. Recommended activities

Based on these findings, the team designed key activities corresponding to identified bridges to these activities to ensure focused approaches that would increase adherence to the two studied behaviors. Key activities to be implemented are as follows:

- 1) **Conduct an in-depth qualitative study.** This activity contextualize certain responses and result in a better understanding of the communities that the F4L *Activity* is working in. For instance, it was important to determine why elder sisters, as a key influencing group, discouraged the consumption of variety of foods among the priority group.
- 2) **Develop a behavior change communication strategy.** This activity serves as a road map of the different communication activities and platforms, such as interpersonal counseling and radio, that can be undertaken at multiple levels (individual, community, township, region/state) to promote the behaviors.
- 3) **Strengthen SSA and nutrition training.** In targeting mothers of U5 and SSA farmers as the two priority groups, this activity features practical demonstrations and focused messages that touch on best aquaculture practices (BAPs) and positive nutrition behaviors.
- 4) **Integrate focused behavior messages on information, education and communication (IEC) materials and mobile application platforms.** Using platforms like the Shwe Ngar app⁷, Htwet Toe, Greenovator and Facebook, this activity promotes the adoption of positive behaviors in multiple languages (Burmese, Shan, Chin). Moreover, it also uses short and interesting videos that capture stories on karma to promote adoption and maintenance of the behaviors.

⁶ The sum of a person's actions in this and previous states of existence, viewed as deciding their fate in future existences.

⁷ <https://digitalarchive.worldfishcenter.org/handle/20.500.12348/4670>

- 5) **Intensify awareness raising events in the study communities.** This activity includes conducting nutrition month campaigns, farmers forum/events and workshops, as well as inviting priority groups and other household members and religious leaders to speak about the importance of practicing the behaviors.
- 6) **Strengthen links between different actors.** In this activity, improving links among hatchery owners, nursery owners and feed suppliers can help farmers access affordable farm inputs and connect mothers with fish producers, which would increase their ability to access fish at more affordable prices in their area. Furthermore, when applicable, it would encourage mothers and families to increase dietary diversity by adopting integrated farming systems: large fish species + small indigenous fish species (SIS) + vegetables and fruits.
- 7) **Form farmers groups and mothers groups.** This activity features key influencers of the priority groups who can meet regularly to discuss their challenges and motivations in practicing the behavior in an informal manner to encourage sharing.

2. Introduction

2.1. Background

The F4L *Activity* focuses on improving the nutritional status of small-scale farmer households in Central and Northern Myanmar by promoting inclusive and sustainable aquaculture growth. WorldFish is leading the F4L *Activity* with support from several IPs: the International Water Management Institute (IWMI), BRAC, PACT, Karuna Mission Social Solidarity (KMSS) and the Myanmar Fisheries Federation (MFF). The *Activity* aims to provide a means of ensuring improved availability of diverse, safe and affordable nutrient-rich foods, especially for women and young children from poor and vulnerable households.

There are three main components of the *Activity*: (1) increase SSA production, (2) increase the use of market systems approaches and (3) improve nutrition and WASH practices.

The intervention focuses on five inland states and regions in Central and Northern Myanmar: Mandalay, Magway and Sagaing in the Central Dry Zone, and Shan and Kachin in the Upland area.



Figure 1. F4L *Activity* intervention areas.

Although these areas present more challenges to aquaculture development and livelihood opportunities, the growth in aquaculture can play an important role in reducing the fish deficit and improving dietary diversity by increasing production and income opportunities.

2.2. Rationale of the study

Myanmar has a high rate of undernutrition and micronutrient deficiencies. Approximately 27% of U5 are stunted and 36% are anemic, while a third of WRA also suffer from anemia (MOHS 2018). In 2017, it was reported that 25% of the population, approximately 54 million people, were living in poverty (WorldBank 2020). This was expected to double in 2021 due to the COVID-19 pandemic and the recent political crisis that hit the country (MAPSA 2021). As a result, this has exacerbated the nutritional problems faced by U5 and WRA.

An undernourished child has an increased risk of impaired mental development and delayed physical development, an increased chance of suffering disease, and will have lower economic opportunities later in life. For women, anemia can cause poor productivity and also has negative consequences for fetal growth and brain development during pregnancy. Poor diet diversity is one of the immediate causes of undernutrition. In Myanmar, less than 50% of households consume diverse diets (MOHS 2018), and this has declined even further, especially among poor households, due to the COVID-19 pandemic and the current political crisis (MAPSA 2021).

To combat these problems, the F4L *Activity* has been promoting integrated farming systems of fish and vegetables in the implementation areas. The aim is to increase income and improve nutrition by improving dietary diversity among households, especially women. To achieve its goals, however, the *Activity* had to consider multiple factors that affect production and food consumption, including income, culture, access to inputs and extension services (Downs et al. 2018; Aung et al. 2021).

In 2020, the F4L *Activity* conducted a baseline study to look into the specific situation of the implementation areas. To determine dietary diversity among women, the study used the MMD-W. This is a tool that is commonly used as a proxy indicator for assessing micronutrient adequacy, which is an important dimension of diet quality of the food consumed by WRA (FAO and FHI360 2016). The baseline findings showed that only 60% of female respondents achieved a dietary diversity score of at least 5, which is the MMD-W cutoff point.

Regarding SSA farmers, pond production and different farming, harvesting and selling practices were studied based on BAPs. Results indicated a lack of knowledge on SSA technology among SSA farmers and poor adherence to BAPs.

Interventions under the F4L *Activity* were delivered to selected participants in the field through community facilitators (CFs) from BRAC, KMSS, MFF and PACT. In the first year of the *Activity*, the CFs were recruited and trained on integrated SSA technology, basic human nutrition and effective WASH practices. And the following year, they received a refresher course.

CFs then provided online and in-person training to SSA farmers and their families on the topics; SSA technology, basic nutrition, vegetable production and effective WASH practices. CFs also monitor SSA farmers during field visits, distribute information, IEC materials and

conduct behavior change communication activities in the communities, such as cooking demonstrations and nutrition awareness campaigns.

The initial efforts of the past year laid out in section 2.2 resulted in considerable accomplishments, but implementing certain practices to achieve the targets proved difficult. The challenges revolved around behavior change necessary among participants to adopt good practices.

Based on the baseline findings and feedback from CFs and IPs, behaviors with particularly poor adoption rates were consumption of diverse food among women of U5 and stocking correct fingerlings by SSA farmers. To study these behaviors in-depth and to use the results to decide on ways forward, it was deemed essential to involve field implementers throughout the process. As such, the most suitable approach was a BA study embedded in the DBC framework.

Doing so would support the following:

- 1) Identify the barriers and motivators of adopting the behavior among women of U5 and SSA farmers.
- 2) Create more refined intervention approaches using the DBC framework, which is relevant for the F4L *Activity* to achieve its goal.
- 3) Develop the capacity of staff from the *Activity* and IPs to achieve the key target indicator results during implementation.
- 4) Fill the information gap on practices among these groups since this is a new area for implementation.

In consultation with CFs and IPs, the following behavior statements and definitions were used to carry out the BA study:

Behavior 1: Mothers of U5 consume at least five of 10 identified food groups every day.

This is the cutoff point in the MDD-W guidelines. It indicates consumption of diverse food, which reflects micronutrient adequacy in diets of WRA based on the guidelines. In most cases, it is difficult for women to consume at least five food groups because of factors such as lack of access, low availability and non affordability of foods. As a result, this prevents them from obtaining nutritious diets, which can lead in nutrient gaps.

Behavior 2: SSA farmers from F4L Activity stock their homestead ponds with 3500–5000 fish fingerlings (3–5 inches long) per acre in every production cycle.

According to the BAP standards, the recommended stocking density of fish fingerlings is 3000–5000 per acre and the recommended size is 3–4 inches long. However, because of the type of fish species that were stocked, it was decided based on experience by the field team to increase the stocking density to 3500–5000 and to increase the size to 3–5 inches.

3. Methodologies

The study identified two behaviors for the BA (Table 1):

- **Behavior 1:** Mothers of U5 consume at least five of 10 identified food groups every day.
- **Behavior 2:** SSA farmers of F4L *Activity* stock their homestead ponds with 3500–5000 fingerlings (3–5 inches long) per acre in every production cycle.

These behaviors were selected because they are important program indicators. It was found that the practices were poorly adopted among respondents during the F4L *Activity* baseline survey.

As behaviors are linked to local context, townships were selected from both agroecological zones covered by the F4L *Activity*: the Central Dry Zone and the Upland areas. Townships were ranked according to their score for each selected behavior. For Behavior 1, Khin U was selected from the Central Dry Zone area and Pekhon from the Upland area, as they have the lowest dietary diversity scores. However, at the time of data collection, Pekhon had to be dropped because of the current military conflict. For Behavior 2, the lowest scores of adopting standard BAPs were Salin in the Central Dry Zone and Taunggyi in the Upland area.

The sample size was 90 respondents per township as per the BA tool, with half of the respondents implementing the selected behaviour (Doers) and the other half of the respondents *not* implementing it (Non-Doers). Table 1 shows the sampling frame.

Behavior	Townships	Respondents		
		Doers	Non-Doers	Total
1. Mothers of U5 consume at least five of 10 identified food groups every day.	Central Dry Zone: Khin U, Sagaing Region	45	45	90
2. SSA farmers of F4L <i>Activity</i> stock their homestead ponds with 3500–5000 fingerlings (3–5 inches long) per acre in every production cycle.	Central Dry Zone: Salin, Magway Region	45	45	90
	Upland: Taunggyi, Southern Shan State	45	45	90

Table 1. Behaviors, location and sample size for the BA.

3.1. Aims of the study

Objective 1: To identify barriers and motivators for the two selected behaviors.

Behavior 1 looks into dietary diversity in Khin U Township to understand which factors limit and enable mothers of U5 to consume at least five of 10 identified food groups on a daily basis.

Behavior 2 explores the barriers and enablers for SSA farmers in Salin and Taunggyi Townships to stock fingerlings of the correct size and in the correct amounts to optimize production.

Objective 2: To apply the DBC framework for further analysis of the BA results and to determine bridges of implementation activities and other key activities to respond and promote positive behaviors. This is used to prioritize and design or tailor interventions as well as to develop a behavior change communication strategy.

3.2. Design and methods

3.2.1. Barrier analysis tool

BA is a rapid assessment tool used to better understand how to successfully promote behaviors by identifying the most significant barriers and motivators to adopting the behavior by the priority group. The BA tool was used for the following reasons:

- 1) It requires a small sample size to conduct the study, but still provides results with a high level of probability (95%).
- 2) It is less costly and less time consuming than other formative research study methods.
- 3) It helps build ownership among team members, as they are involved in the whole process, from developing questionnaires, interviews, coding and tabulation to designing key activities based on the results.
- 4) It supports both team spirit and capacity building for conducting field research.

(See Annex 1 for additional information on BA methodology.)

BA uses a qualitative study methodology and requires 45 people, called “Doers,” who practice a required behavior and 45 people, called “Non-Doers,” who do not.

For the first behavior, Doers were defined as mothers of U5 who consumed at least five of the 10 food groups as indicated by the MDD-W guidelines in the 24 hours before the interview, while Non-Doers were mothers of U5 who consumed less than four of the food groups during the same timeframe. To have a food group included, the respondent had to consume at least 1 tablespoon (15 g or more) of each food group, similar to the MDD-W guidelines.

For the second behavior, Doers were SSA farmers who stocked 3500–5000 fingerlings (3–5 inches long) per acre during their most recent production cycle, while Non-Doers stocked fewer than 3500 or more than 5000 fingerlings per acre using fingerlings that were either smaller than 3 inches or larger than 5 inches. The recommended stocking size and quantity was based on BAP standards.

Respondents of the two priority groups were individually interviewed. Initial questions aimed to screen the respondents and classify each one as either a Doer or Non-Doer. These were later followed up with a specific set of Doer or Non-Doer questions.

3.2.1.1. BA questionnaire development

The study questionnaire was based on the standard BA questionnaire format developed by Bonnie Kittle of Helen Keller International US (Kittle 2017). It explores 12 determinants that can influence behaviour (Annex 2). The questionnaire was revised according to the behavior statements of the F4L *Activity* team in consultation with the technical expert of Save the Children Myanmar.

The questionnaire was translated from English into Burmese, the main language of the priority groups. The translated questionnaire was presented during online training and was revised after receiving feedback from the enumerators, who were also F4L *Activity* field staff. The questionnaire was field tested for half a day in the study townships, after which the technical experts provided comments and suggestions and mentored the enumerators on effective interviewing. Annex 3 contains the final BA questionnaire format in both English and Burmese.

3.2.2. Designing behavior change framework

The results of the BA survey were used to create the bridges to activities as part of the DBC framework. The framework presents key elements that help develop a behavior change strategy and activities to address behavioral barriers and motivators. The key elements are behaviors, priority groups or influencing groups, determinants, bridges to activities, and the activities.

(See Annex 1 for additional information on the DBC methodology.)

3.3. Training enumerators

One of the reasons for selecting the BA tool was to include existing staff in data collection, analysis and development/revision of program strategies. In the F4L *Activity*, CFs and team leaders of the IPs were trained as enumerators. These staff members had a good understanding of implementation activities and had several responsibilities: (1) conduct field activities to deliver SSA and nutrition training, (2) disseminate fish and vegetable seeds, fish feeds and WASH materials, (3) monitor fish growth in SSA ponds and (4) conduct nutrition and WASH awareness raising activities for F4L *Activity* participants.

Prior to conducting the BA, the F4L *Activity* team, along with CFs and team leaders from IPs, received online training on January 11–15, 2021. The training sessions were called Designing for a Behavior Change and were facilitated by Dr. Saw Eden, a BA expert and nutrition advisor for Save the Children Myanmar. From the training sessions, the team (1) gained knowledge on the importance of the BA study, (2) developed skills on conducting BA study, and (3) applied the DBC framework to develop program strategies based on the study results. (See Annex 4 for topics and training schedule details.)

Before the actual implementation of the study, Dr. Saw Eden conducted a 2-day BA refresher training on July 5–6, 2021, to review the concepts, test the BA questionnaire in the field and conduct practical sessions on effective interviews. A total of 23 participants from F4L *Activity* team along with staff from BRAC and PACT attended the training. (See Annex 4 for topics and training schedule details.)

3.4. Sampling

For implementation, the study only considered townships covered by the F4L *Activity*. As behaviors are linked to local context, townships from both agroecological zones were selected: the Central Dry Zone and the Upland area. Townships were ranked according to their score for the respective behavior.

For Behavior 1, the township with the lowest score for dietary diversity in the Upland area was Pinlaung in Southern Shan, but it had to be dropped as not enough human resources were available to conduct the study there. The second on the list was Pekhonn, but this township also had to be dropped because of the continuing military conflict during the time of study preparation until the data collection. Between the military conflict and COVID-19 restrictions, as well as limited human resources, it was not feasible to select a replacement township at that time. As a result, for Behavior 1 Khin U Township in Sagaing was selected from the Central Dry Zone. For Behavior 2, the lowest scores for fish production were Salin in the Central Dry Zone and Taunggyi in the Upland area.

The study used purposive sampling to select villages: three villages in Khin U, six in Salin and seven in Taunggyi. At the time of study, the field team had been conducting SSA and improved human nutrition and WASH activities with implementation participants in the study villages for over a year. Proximity to local markets was also taken into account and varied, with selected study villages located 1–30 miles from local markets. (See Annex 5 for list of villages and the teams collecting the data.)

For each behavior, a minimum of 45 Doers and 45 Non-Doers needed to be surveyed from each township. Enumerators screened potential respondents and divided them into Doer or Non-Doers. For Behavior 1, respondents could be any mother with a U5, regardless of whether she was a direct beneficiary of the F4L *Activity*. For Behavior 2, however, all the respondents were SSA farmers who are participants of the *Activity*. (See section 3.2 for more details.)

Enumerators would start in one village and then move to the next village until enough respondents were found to meet the criteria of 90. A total of 284 respondents were interviewed face-to-face (Table 2).

Behaviors	Townships	Number of respondents reached		
		Doers	Non-Doers	Total
Behavior 1	Khin U, Sagaing	51	45	96
Behavior 2	Salin, Magway	47	47	94
	Taunggyi, Southern Shan	45	49	94

Table 2. Number of respondents reached per township.

3.5. Data collection

Data was collected on July 7-12, 2021, in Khin U, Salin and Taunggyi. Before starting, the teams informed the village authorities of the purpose of the survey, which was understood to be sufficient at the time.

For each township, the team was composed of six enumerators, except for Taunggyi, which had only five (Annex 5). Every team had a supervisor and co-supervisor who supported the team remotely. They were responsible for the following: (1) ensure interview quality, (2) help find solutions to issues encountered at the field, such as having to change the study village because of COVID-19 restrictions, (3) track and report the number of respondents that the team reached, and (4) report the number of respondents and the issues encountered to the F4L *Activity* human nutrition specialist, who led the survey.

The majority of in-person interviews were done at respondent's homes. However, a few respondents were interviewed in a central location in the village because of the distance of respondent's house and the restrictions imposed by the local authorities. Consistently, the enumerators conducted the interviews in private and asked for consent before proceeding.

In addition, the enumerators were assisted by aquaculture promoters (APs), who are local volunteers selected by the IPs. They received a minimal stipend to support IP staff in implementing extension activities at the village level, such as distributing seeds and fish fingerlings.

Due to the COVID-19 pandemic, for the safety of the team and the respondents, enumerators adhered to the following protocols:

- wearing masks at all times
- using hand sanitizers as needed
- maintaining physical distancing at all times
- conducting interviews outdoors
- politely asking respondents to wear a mask at all times (enumerators provided masks when needed).



Plate 1. Phyo Ko Ko Aung, an enumerator from PACT, interviewing an SSA farmer in Salin Township.

A list of the data collection team is found in Annex 5.

3.6. Coding, tabulation and result analysis

After 4.5 days of data collection, manual coding, tabulation and analysis followed. The process took 2 days to complete and was done online with the facilitation of Dr. Saw Eden. A total of 51 Doers and 45 Non-Doers in Khin U, 47 Doers and 47 Non-Doers in Salin, and 45 Doers and 49 Non-Doers in Taunggyi were interviewed. However, the team agreed to analyze data from the required sample size based on the BA methodology, which meant that 45 Doers and 45 Non-Doers were needed for each township. As a result, eight Doers and six Non-Doers were randomly removed, leaving 90 survey respondents for analysis in each township.

Prior to coding, a brief introduction and coding game based on the BA guide was conducted to familiarize the enumerators with the coding process. Afterward, the enumerators took the BA questionnaire that they filled in during the interview and placed it in front of them for ease when tabulating the responses. The Doer questionnaires were coded first and the Non-Doer questionnaires second.

During the tabulation, coded responses were entered into a Microsoft Excel spreadsheet and presented via the Zoom video platform. The results were then entered into a BA standard Excel tabulation sheet. The tabulation sheet was provided as part of the DBC and BA workshop package and followed the same process and steps as listed in “A Practical Guide to Conducting a Barrier Analysis” (Kittle 2017).

The tabulation sheet automatically calculated and highlighted any 15-point difference between Doer and Non-Doer responses and identified those determinants that were statistically significant. The significant responses were then used to develop bridges to activities and as well as recommendations for the F4L *Activity*.

3.7. Challenges and limitations

During the survey, the study team encountered the following challenges and limitations that could have affected the results:

- a) Travel restrictions from the ongoing COVID-19 pandemic and political instability resulted in devising online training and processing of data by the BA experts. They also forced F4L supervisors and the human nutrition specialist to supervise the enumerators remotely instead of in person, which may have influenced the effectiveness of the training and the quality of the data.
- b) The enumerators encountered a language barrier in the Southern Shan area because of a lack of time and a limited number of staff available. Staff who only spoke Burmese were assigned to conduct interviews among Shan respondents who spoke limited Burmese, which made the interviews difficult and increased the likelihood of misinterpretation of responses.
- c) As this was the first time many enumerators had conducted a BA study, they lacked experience in conducting qualitative interviews. The majority of the enumerators had experience with structured interviews that had close-ended questions, but they were less experienced as qualitative interviewers. This resulted in difficulties probing and asking follow-up questions to triangulate and confirm the appropriateness of responses.

Moreover, although the BA survey questions were translated into Burmese and were tested a few times by the team, the enumerators still found it challenging to phrase the questions in such a way that the respondents fully understood the exact meaning. This was particularly the case for perceived positive/negative consequences and perceived social norms.

- d) Enumerators found it difficult to identify food groups for Behavior 1 screening questions. For certain foods consumed by the respondents, the team faced difficulties classifying the item as condiment or a food group (such as fish paste, bean paste or bean curd), which might have affected selecting the Doer and Non-Doer groups.

4. Significant results

4.1. Consumption of diverse foods in Khin U

The responses of mothers with U5 in Khin U Township were tabulated as described in section 3. Responses between Doers and Non-Doers were considered significant when showing at least a 15-point difference. For Behavior 1, the significant barriers and enablers that were found are described in sections 4.1.1 to 4.1.5. Overall, results suggest that a lack of time and money are the most important barriers for mothers, as indicated both in perceived self-efficacy and perceived negative consequences.

Five significant determinants were found across the township: self-efficacy, positive and negative consequences, social norms, action efficacy and divine will.



Plate 2. Aung San Win, an enumerator from BRAC, interviews a mother in Khin U Township.

A detailed summary of significant barriers and enablers for the priority group is provided in Annex 6.

4.1.1. Self-efficacy

Explanation: This determinant refers to the mother's belief that she can do the behavior with her current level of knowledge, skills and resources. She was also asked what makes (or would make) it easier or difficult for her to do so.

Doers were 20.9 times more likely than Non-Doers to say that they are able to practice the behavior, while Non-Doers were 12.6 times more likely to say they could not.

In addition, Doers were 11.9 times more likely than Non-Doers to say that it makes it **easier** for them *"to consume variety of foods because these foods are delicious."*

However, respondents found it **difficult** to practice the behavior because *"they lack the time and do not have enough money or work to buy a variety foods."*

4.1.2. Positive and negative consequences

Explanation: This determinant refers to any consequences that the mother thinks will happen when practicing the behavior. She was asked what are (or would be) the advantages and disadvantages of doing so.

Respondents mentioned that one of the **advantages** of practicing the behavior is that *"it makes them feel strong and energetic."*

On the other hand, Non-Doers were 2.9 times more likely than Doers to say that one of the **disadvantages** of buying a variety of foods is that *"it is costly, thus, will incur additional expenses for the family."*

Moreover, Non-Doers were 3.4 times more likely to say that *“it is time consuming to buy and prepare a variety of foods.”*

Additionally, respondents indicated that consuming a variety of foods *“makes them feel dizzy and causes vomiting, food poisoning, sickness, especially when foods are not appropriate for them.”*

4.1.3. Social norms

Explanation: This determinant refers to the mother’s perception of who she thinks approves or disapproves of her practicing the behavior.

Respondents indicated that they perceived their **sister** is the one who disapproves of them consuming at least five of the food groups every day.

4.1.4. Action efficacy

Explanation: This determinant refers to the mother’s perception that by practicing the behavior she will avoid health/nutritional problems (such as anemia, weakness, tingling and numbness of feet and fingers, fatigue) or that the behavior is effective in avoiding the problem.

Doers were 2.4 times more likely than Non-Doers to say that it is **very unlikely** that they will have nutritional problems if they practice the behavior.

4.1.5. Divine will

Explanation: This determinant refers to the mother’s perception that it is either Karma or God’s will for her to have health/nutritional problems (such as anemia, weakness, tingling and numbness of feet and fingers, or fatigue).

There was an **equal number of “yes” and “no”** responses from respondents who said that they perceive Karma causes them to have health/nutritional problems.

4.2. Stocking fish in Salin and Taunggyi

Based on the 15-point difference between the responses of Doers and Non-Doers, the significant barriers and enablers for Behavior 2 in Salin and Taunggyi townships are presented in sections 4.2.1–4.2.8.

Six significant determinants were found across both townships: perceived self-efficacy, perceived negative consequence, perceived positive consequence, perceived social norms, perceived access and perceived cues for action. In addition to these determinants, perceived action efficacy is also significant for Salin and perceived divine will in Taunggyi.

A summary of significant barriers and enablers for the priority group is found in Annex 7.

4.2.1. Self-efficacy

Explanation: This determinant refers to the SSA farmer's belief that they can do the behavior with their current level of knowledge, skills and resources. The SSA farmer was asked what makes (or would make) it easier and difficult for them to practice the behavior.

In Salin, Doers were 5.5 times more likely than Non-Doers to say that it is **easier** to practice the behavior *"because of their experience that fish has high survival rate and will not disappear."*

While in Taunggyi, Doers were 3.9 times more likely to say it is **easier** *"because their pond has rich natural fertilizer they are assured that fish will grow well."*

Moreover, Non-Doers were 3.6 times more likely than Doers to say that it is easier to practice the behavior *"because of their experience of few fish deaths and few fish got lost."*

Additionally, respondents indicated that *"because of their knowledge that fish needs good space to grow and that predators, such as predatory fish, birds and snakes, will not eat fish fingerlings."*

In terms of what makes it **difficult** to practice the behavior, Doers in Salin were 3.1 times more likely to say *"because it requires additional money and needs more fish feed, which can be costly."*

Moreover, respondents mentioned that *"they are worried that fish gets stolen and poisoned because the pond is far, as well as it is time consuming to manage the pond."*

While in Taunggyi, respondents indicated that *"they fear that fish will be eaten by predators."*

4.2.2. Positive and negative consequences

Explanation: This determinant refers to any consequences that the SSA farmer thinks will happen when practicing the behavior. The SSA farmer was asked what are (or would be) the advantages (and disadvantages) of doing so.

In Salin, Doers were 2.4 times more likely than Non-Doers to say that one of the **advantages** of practicing the behavior is that *"they themselves are healthy because they can eat fish."*

Meanwhile, Doers in Taunggyi were 6.9 times more likely to respond that *“they have good access to fish for consumption because they can harvest it from their pond. Also, they can dry the fish which saves them money.”*

They were also 4.4 times more likely to say that *“they can give presents.”*

Non-Doers were 8 times more likely to say that *“they can get income and profit that can support in purchasing food for the family.”*

Additionally, respondents indicated that *“fish growth is faster due to good space of the pond, can sell faster.”*

For **disadvantages**, Non-Doers in Salin were 4.9 times more likely than Doers to say that *“stocking of many fish cause slow growth.”*

They were also 2.8 times more likely to say that *“because their ponds dry up easily, farmers harvest earlier even if it is not yet the marketable size.”*

Meanwhile, Doers in Taunggyi were 3.3 times more likely than Non-Doers to say that *“they are worried that fish will be lost due to predatory fish, snake, frog and birds.”*

While Non-Doers were 3.6 times more likely to say, *“It is more costly as the fish fingerling is big and it needs more fish feed. Also, it is difficult to buy fish fingerling at the right size and transporting it is challenging.”*

4.2.3. Social norms

Explanation: This determinant refers to the SSA farmer’s perception of who they think approves or disapproves of practicing the behavior.

In Taunggyi, respondents indicated that their **mother approves** of practicing the behavior while those in Salin said that their **grandfather disapproves**.

4.2.4. Access

Explanation: This determinant refers to the degree of availability of the inputs or services for an SSA farmer to practice the behavior. The SSA farmer was asked the level of difficulty in stocking fish fingerlings at the recommended quantity and size in each production cycle.

In Salin, Doers were 2.2 times more likely to say that it is **somewhat difficult** for them to access inputs or services, while Non-Doers were 2.4 times more likely to say that it is **very difficult** for them to do so. On the other hand, Non-Doers in Taunggyi were 2.7 times more likely to say that it is **somewhat difficult** for them to access inputs or services.



Plate 3. Nang Wai Min Kyi, an enumerator from BRAC, interviews an SSA farmer in Taunggyi Township.

4.2.5. Cues for action or reminders

Explanation: This determinant refers to the SSA farmer's ability to remember to stock fish fingerlings at the recommended quantity and size in each production cycle.

In Salin, Doers were 3.3 times more likely to respond that it is **not difficult** to remember to practice the behavior, while Non-Doers were 2.2 times more likely to say that it is **somewhat difficult** to remember. Similarly, respondents in Taunggyi indicated that it is **somewhat difficult** to remember to do so.

4.2.6. Action efficacy

Explanation: This determinant refers to the SSA farmer's perception that by practicing the behavior they will avoid the problem (low income/low profit) or that the behavior is effective in avoiding the problem.

In Salin, respondents mentioned that it is **somewhat likely** that they will avoid low income or profit if they practice the behavior. On the other hand, respondents in Taunggyi said that this was not a significant determinant.

4.2.7. Divine will

Explanation: This determinant refers to the SSA farmer's perception that it is either Karma or God's will for them to have the problem.

In Taunggyi, there was an **equal** number of **"yes"** and **"no"** responses that it is Karma or God's will that they will earn low income or profit. For Salin, this was not considered a significant determinant.

4.2.8. Universal motivators

Unrelated to practicing the behavior, respondents from Salin mentioned that their **life's desires** are "to have happy, healthy and peaceful family" and "to be rich."

In Taunggyi, their main **life's desire** was to *"have a regular income, job, successful business and good agricultural production."*

5. Discussions and recommendations

The results in sections 4.1 and 4.2 revealed multiple barriers and enablers in practicing the two behaviors among the priority groups. Section 5.1 lists recommendations that can be implemented in the areas that the F4L *Activity* is working in.

5.1. Consumption of diverse foods

5.1.1. Self-efficacy

Many women shared two main barriers: (1) a lack of money to purchase different types of food and (2) a lack of time to prepare a variety of foods. These barriers are even more significant nowadays, as the ongoing COVID-19 pandemic and political crisis in Myanmar have left many households with less income, which has affected their ability to buy food. In addition, women are responsible for most household duties as well as helping with farm activities, leaving little time to prepare food. These challenges result in stress and an excessive workload, which have negative implications for their nutrition and health.

The following recommendations are meant to help overcome these barriers:

1. **Awareness sessions:** Suggest that the F4L *Activity* strengthen its nutrition awareness sessions, conduct activities at times convenient for the mothers and design sessions to be practical and engaging, such as cooking demonstrations and competitions. Develop and share recipes on simple dishes for children and adults that are prepared using affordable ingredients while covering at least five food groups from the MDD-W guide. In addition, the F4L *Activity* could complement these activities with simple and attractive IEC materials that illustrate different combinations of ingredients that make for affordable nutritious meals. These IEC materials and messages should highlight the response from Doers that eating a variety of foods is delicious and that nutrition food helps improve nutrition and boost immunity, especially during the COVID-19 pandemic.
2. **Access to affordable fish:** Connect women to F4L *Activity* SSA farmers in the same village and ask the farmers to let the women know when they are harvesting fish and then sell it to them. This will create better access to different types of affordable fish, both large species and SIS. The farmers/wives of SSA farmers can also share their experience in growing vegetables along pond embankments.



Plate 4. Mothers and children looking at IEC materials during the Nutrition Month Campaign in Pwint Phyu Township.

3. Engage husbands: During nutrition sessions and events, engage husbands to ensure they understand the importance of having diverse diets. Discuss their role in how they can support and facilitate this on a daily basis by contributing money to buy food, providing ingredients from the farm or ponds, spending time fishing or hunting and sharing some household tasks so that women have enough time to cook.
4. Promote an integrated farming system of fish and vegetables/fruits. This would increase food production at home and, therefore, improve diversity in their diets. Also, introduce homemade production of dried small fish powder to increase the nutritional value of the prepared dishes.

5.1.2. Positive and negative consequences

The key motivator of the priority group in practicing the behavior that consuming a variety of foods can make them feel strong and energetic can be highlighted in communication materials, such as brochures, recipe leaflets, posters, the Shwe Ngar and Htwet Toe mobile application and Facebook, as well as during nutrition awareness sessions. In addition, messages should show a variety of foods, not overconsumption of food, and that women should purchase and consume affordable nutrient-dense foods, such as fish, fruits, vegetables and beans, over foods that are considered unhealthy, such as those full of fat, oils and sugar.

5.1.3. Social norms

Women who say that their sister is the one who disapproves of them practicing the behavior should emphasize the importance of including other household members in nutrition awareness sessions, as they can influence the behaviors of the priority group. This also reinforces the norms that, in Burmese culture, women are responsible for household nutrition. Aside from involving the sister, who is the key influencer, grandmothers and aunts can also be included in nutrition activities to help share their positive experiences on consuming a variety of foods. This would increase the likelihood of the priority group adopting the behavior.

5.1.4. Action efficacy

Behavior change communication activities could reinforce Doers who felt that they are unlikely to get nutritional problems, such as anemia, when practicing the behavior. This would facilitate adoption of the behavior among the priority group. In addition, women who practice the behavior should be included in support groups for mothers. In doing so, they would become role models for other women and help influence them by sharing their practical experience of how they are able to maintain the behavior.

5.1.5. Divine will

Myanmar is predominantly Buddhist, while a small percentage of the population is Christian and Muslim. As a result, when conducting behavior change communication activities, such as nutrition counseling sessions and nutrition month celebrations, it is important to involve religious leaders, elders and other respected people in the village as teachers. They can be invited to speak and communicate key messages on the importance of consuming a variety of foods to improve nutrition, as having good health brings with it good mind and soul.

5.2. Fish fingerlings

5.2.1. Self-efficacy

Doers confirmed that knowledge and experience in providing ample space in the pond for fish fingerlings were crucial for practicing the behavior. This highlights the importance of providing extension services to SSA farmers so that they can gain technical knowledge and apply this in their farms to increase the likelihood of successful production.

As a result, the F4L *Activity* needs to implement the following:

1. Intensify field activities: Conduct farmer training sessions that focus on field demonstrations. Invite SSA farmers who can act as role models to share their experience, and organize peer-to-peer visits to SSA farmers who are applying BAPs. In addition, develop key messages emphasizing that stocking the recommended size of fish fingerlings results in a high survival rate and requires less time for them to reach marketable size. This will allow farmers to earn income more quickly. Lastly, cover demonstrations and discussions on proper pond preparation during the training, including the importance of using lime, removing predatory fish from the pond and making strong pond embankments.
2. Develop and disseminate IEC materials: Feature success stories of SSA farmers to encourage other farmers to adapt SSA technologies. Also, make use of digital platforms such as Shwe Ngar app, Htwet Toe and Greenovator to help increase their knowledge on good practices of farming fish.

5.2.2. Positive and negative consequences

The main advantage that Doers noted is easier access to fish for consumption. This highlights the importance of fish as a main source of animal protein and essential nutrients in diets of rural communities in Myanmar. Fish is eaten in many forms, including fermented, smoked and dried, and it can also be processed at home to extend its shelf life. Producing food at home saves money, which is very helpful, especially during crises like the COVID-19 pandemic and the current political instability.

Adopting polyculture methods of farming fish by integrating large species and SIS. This would boost both income and nutrition, as large fish can be sold while SIS can be eaten at home. When eaten whole (including head and bones) SIS are highly nutritious compared with large fish species, such as carp and tilapia.

When developing IEC materials, make sure that messages highlight the (1) ease of access to food, (2) potential for saving money and (3) use as gifts for other people to earn good Karma. During SSA farmer training, the field team should focus on the following topics: (1) the importance of good pond preparation, (2) protective measures, such as blue nets around the pond, and (3) higher pond embankments. These measures need to be followed so that farmers can apply them in their ponds to ensure high production.

5.2.3. Social norms

It is quite interesting that the priority group considers their mother as the person who influenced them in practicing the behavior, especially since fish farming and fishing are male dominated activities in Myanmar. Conversely, grandfathers disapproving of the behavior was an unexpected response. Further investigation is required into the role of these influencers to develop and tailor relevant activities.

5.2.4. Access

One of the critical parts in fish production is access to good quality fish fingerlings and inputs. Both Doer and Non-Doers considered a lack of access as one of the barriers to practicing the behavior. This suggests that more support is needed to establish or renovate hatcheries and nurseries as well as develop the technical capacity of fingerling producers in F4L *Activity* areas to better serve market demand. Moreover, analyzing the root causes of the issues and challenges can help identify innovative and sustainable solutions.



Plate 5. Distributing fish fingerlings in the village.

5.2.5. Cues for action/reminders

Based on the responses from the priority group, they find it less difficult to remember to practice the behavior, even though it was still necessary to gently remind them to practice it. Because of this, the F4L team could ask SSA farmers to display F4L posters with key messages that fingerlings of the proper size and correct stocking density will earn income and food for the family. Posters could be placed at central locations in the village and other conspicuous places, such as near ponds and in storage areas for fish feeds. Messages could also be shared through social media platforms, mobile phone messages and via the Shwe Ngar app.

5.2.6. Action efficacy

Another way to motivate the priority group to adopt the behavior is to create farmer events in the village featuring *Activity* participants who experienced good harvests. They could share their best practices and past failures so that others could learn from them. Later on, these participants could be identified as farmer leaders tasked with supporting a small group of farmers who are struggling to adopt good aquaculture practices. In these small groups, farmers can compare their production, income and profits with each other so that they can identify what works best and find solutions together with the help of the farmer leader and the F4L field team.

5.2.7. Divine will

Similar to the recommendations for Behavior 1, it is important to include different religious leaders during farmer events so that they can encourage SSA farmers to adopt good aquaculture practices by focusing on the key message that good production results in income, food for the family and more nutritious diets, and also helps others, especially during times of crises.

6. Bridges to activities

To address these determinants, the enumerators, who are also staff from implementing partners and F4L *Activity* team members together with the Save the Children team, developed bridges to activities that link to recommended activities for promoting social behavior change in F4L *Activity* intervention areas.

These activities were conducted online, and the team presented the results via Zoom for discussion, feedback and suggestions. Although the recommended activities were specific to Khin U, Salin and Taunggyi townships, they may be replicable in other areas with a similar geographical, social and cultural context. Section 6.1 lists the bridges to activities and recommended activities that the BA study team identified.

6.1. Behavior 1: Consumption of diverse foods

- Increase their ability to consume at least five of the 10 MDD-W food groups every day.
- Increase their perception that they like eating variety of foods because they are delicious.
- Improve their knowledge that there are affordable and nutritious food options available in the area.
- Increase their perception that consuming at least five of the food groups will make them feel strong and energetic and also enable them to earn income and take care of their children.
- Decrease their perception that these foods will cause dizziness, vomiting, food poisoning and other illnesses.
- Increase their perception that there are affordable, diverse and nutritious foods that are available in their area and that multiple dishes requires less time to prepare.
- Reinforce the perception that although their sisters disapprove, other family members approve of them practicing the behavior.
- Increase their perception that they can prevent health/nutritional problems (such as anemia, weakness, fatigue, and tingling and numbness of feet and fingers) by practicing the behavior.
- Decrease their perception that it is Karma or God's will that causes them to have these problems.

6.2. Behavior 2: Fish fingerlings

(Note: Unless indicated, Similar bridges to activities were combined for Salin and Taunggyi townships.)

- Increase their ability to follow the standards for stocking fish fingerlings at the right density and size.
- Reinforce the perception that buying fish fingerlings of standard size and quantity and observing that correct pond preparation, including liming the pond bottom and removing predatory fish, results in profits.
- Improve their ability and knowledge to secure their pond so that fish will not be stolen and poisoned.
- Improve their perception that proper pond management requires time but will lead to income (Salin only).
- Increase their perception that having natural/organic foods in the pond will make it easier to practice the behavior (Taunggyi only).

- Reinforce their perception that consuming fish will make them feel healthy (Salin only).
- Increase their perception that practicing the behavior can result in profits, ensure food for the family and be used as gifts for others (Taunggyi only).
- Reinforce the perception that creating fences, using blue nets, and good pond embankments, will help secure the fish.
- Increase the perception that stocking fish fingerlings of the right size ensures that fish will reach marketable size before the ponds dry up (Salin only).
- Increase their perception that observing the standard stocking density results in good fish growth (Salin only).
- Increase their perception that although their grandfather disapproves of the behavior, others household members, such as their father or wife, approves of it (Salin only).
- Increase their perception that their mother approves of them practicing the behavior (Taunggyi only).
- Increase the access of SSA farmers to fish fingerlings at the recommended quantity and size for each production cycle.
- Increase the ability of SSA farmers to remember to stock their homestead ponds with 3500–5000 fingerlings per acre at the recommended size (3–5 inches) for each production cycle.
- Reinforce the perception that practicing the behavior can earn them high income and profits (Salin only).
- Decrease their perception that it is Karma that causes them to earn low income or profit (Taunggyi only).

6.3. Recommended activities based on the DBC framework

Tables 3 and 4 summarize the bridges to activities and recommended activities based on significant findings from the study.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Self-efficacy	- They lack time and they do not have enough money or a job to buy a variety of foods (barrier). - They like consuming a variety of foods because they are delicious (motivator).	Doers were 11.9 times more likely than Non-Doers to give this response.	- Increase their ability to consume at least five of the 10 MDD-W food groups every day. - Increase their perception that they like eating a variety of foods because they are delicious. - Improve their knowledge that there are affordable and nutritious food options available in their area.	- Create IEC materials on the 10 food groups, including a food menu with attractive photos, and emphasize messages that eating at least five of the food groups a day will make them healthy. - During awareness raising sessions, incorporate games and practical demonstrations. These include purchasing food to show how they can buy affordable and diverse food, as well as an expense calculation of five daily food groups and a food menu with a price list to show that eating a variety of foods is indeed attainable. - Promote an integrated farming system of fish and vegetables/fruits to increase food production at home, which increases the likelihood of improving diversity in their diets.
Positive consequences	It makes them feel strong and energetic (motivator).		Increase their perception that consuming at least five of the food groups will make them feel strong and energetic. It will enable them to earn income and take care of their children.	- Make use of digital platforms, such as the Shwe Ngar app, Htwet Toe, Greenovator and Facebook, to disseminate videos that feature Doer mothers sharing their experience of being strong and energetic when working and caring for their children. - Share success stories among mothers groups on the benefits of practicing the behavior after harvesting fish and vegetables.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Negative consequences	- It makes them feel dizzy and causes vomiting, food poisoning and sickness, especially when foods are not appropriate for them (barrier). - As an additional expense, it costs money to buy these foods (barrier). - It is time-consuming to buy and prepare food (barrier).	Non-Doers were 2.9 times more likely than Doers to give this response. Non-Doers were 3.4 times more likely than Doers to give this response.	- Decrease their perception that it will cause dizziness, vomiting, food poisoning and other illnesses. - Increase their perception that there are affordable, diverse and nutritious foods that are available in the area and that multiple dishes require less time to prepare.	- Conduct cooking demonstration sessions using ingredients that consist of five of the 10 food groups. Then let the mothers try the food to give testimony that it will not cause dizziness, vomiting, food poisoning and other illnesses. - Conduct field visits to households that have adopted an integrated farming system (fish and vegetables) to demonstrate that it is easier to access food when it is produced at home. - Train fish processing technologies for different types of processed fish, such as dried fish, fish paste, fermented fish, <i>nga moke kyaw</i> and dried small fish powder, to increase income among mothers. - Develop IEC materials that highlight key messages that a variety of foods does not mean eating too much food and that they can purchase and consume affordable nutrient-dense foods, such as fish, fruits, vegetables and beans, instead of foods that are full of fat, oil and sugar.
Social norms	Their sister disapproves of the behavior (barrier).		Reinforce the perception that although their sisters disapprove, other family members approve of them practicing the behavior.	Form support groups for mothers and invite women household members, such as grandmothers and aunts, to share their experience of the importance of consuming diverse foods.
Action efficacy	It is not likely at all.	Doers were 2.4 times more likely than Non-Doers to give this response.	Increase their perception that they can prevent health/nutritional problems (such as anemia, weakness, fatigue, and tingling and numbness of feet and fingers) by practicing the behavior.	Form support groups for mothers as well as a fish farmers committee in which Doers or committee members share their experience of living healthy—free of health/nutritional problems (such as anemia, weakness, fatigue, and tingling and numbness of feet and fingers) to encourage others to practice the behavior.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Divine will	There were an equal number of “yes” and “no” answers.		Decrease their perception that it is Karma that causes them to have health/nutritional problems, such as anemia, weakness, fatigue, and tingling and numbness of feet and fingers.	- Create role-playing scenarios and produce IEC materials that feature a story about a mother who found that it was not Karma that caused her health/nutritional problems and that she has recovered by eating five of the food groups every day. - During nutrition awareness sessions, invite religious leaders to speak about the importance of practicing the behavior for good health.

Table 3. Behavior 1: Consumption of diverse foods among mothers of U5 in Khin U Township.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Self-efficacy	Salin - It requires additional money to purchase the recommended size of fish fingerlings and requires more fish feeds, which can be costly (barrier). - Women are worried that the fish will be stolen and poisoned because the pond is far from the house. It is time consuming to manage the pond, such as feeding the fish (barrier). - SSA farmers realize that fish have high survival rate and are not going to disappear (motivator).	Doers were 3.1 times more likely than Non-Doers to give this response.	- Increase their ability to follow the standards for stocking fish fingerlings at the right density and size. - Reinforce the perception that buying fish fingerlings of standard size and quantity and observing correct pond preparation, including liming the pond bottom and removing predatory fish, will result in profits. - Improve their ability and knowledge to secure their pond so that fish will not be stolen or poisoned. - Improve their perception that proper pond management requires time but will lead to income (Salin only). - Increase their perception that natural/organic foods in the	- Emphasize the following during training sessions: (1) install ropes across the pond, blue nets around the pond embankment, and reflectors and scare crows to prevent birds from eating the fish, (2) observe correct stocking density, and (3) use proper pond preparation and pond management to achieve a high survival rate to reach marketable size in less time. - Disseminate IEC materials, such as posters and pamphlets, with messages on (1) putting up fences to secure fish fingerlings, (2) the importance of repairing pond dikes, (3) selecting a good site for fish farming, (4) as well as success stories of SSA farmers adopting SSA technologies. - Establish nursery ponds near or inside the villages to minimize the distance of transporting fish fingerlings and to reduce transportation costs.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
	Taunggyi - There is a fear that fish will be eaten by snakes, birds and predatory fish (barrier). - SSA farmers learned that fish need ample space for growth (motivator). - SSA farmers found that few fish disappeared and died, which made it easy to manage their pond (motivator). - SSA farmers realized that predatory fish, snakes and birds will not eat fish fingerlings (motivator). - Farmers learned that fish will grow well in a pond that is rich with natural fertilizer (motivator).	Doers were 5.5 times more likely than Non-Doers to give this response. Non-Doers were 3.6 times more likely than Doers to give this response. Doers were 3.9 times more likely than Non-Doers to give this response.	pond will make it easier to practice the behavior (Taunggyi only).	- Provide links to microcredit institutions for interested fish farmers. - Conduct field visits or exposures to SSA farmers who observe proper pond management, such as using rich natural fertilizer, installing blue nets and making good pond embankments, so that other farmers can learn and feel motivated.
Positive consequences	Salin - Farmers feel healthy because they can eat fish (motivator). Taunggyi - Farmers can earn income and profit that can help them purchase food for the family (motivator). - Harvesting fish from their own pond allows better access to fish and thus improved consumption. Also, farmers can make dried fish and consume it,	Doers were 2.4 times more likely than Non-Doers to give this response. Non-Doers were 8 times more likely than Doers to give this response. Doers were 6.9 times more likely than Non-Doers to give this response.	- Reinforce their perception that consuming fish will make them feel healthy (Salin only). - Increase their perception that practicing the behavior can result in profits, ensure food for the family and make for gifts to others (Taunggyi only).	- During farmers meetings and training sessions, invite model SSA farmers to share their testimony that they are in good health from eating fish. - Establish demonstration ponds to show SSA farmers the potential of earning higher income on time when they practice the behavior. - Encourage adoption of polyculture methods of farming fish (integrated large species and SIS) to increase overall production, resulting in increased income and improved nutrition. - Form peer farmers groups, and during meetings let the Doers give testimony on the multiple benefits of practicing the behavior: it provides easy access to fish for consumption, saves

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
	which can save money (motivator). - Ample space in the pond allows for faster fish growth, which means farmers can sell at the right time (motivator). - Farmers can give their fish as presents to others (motivator).	Doers were 4.4 times more likely than Non-Doers to give this response.		money by drying fish, shortens harvest times and makes for gifts to others. Make use of digital platforms to widely disseminate key messages.
Negative consequences	Salin - Farmers worry that fish will get lost during heavy rain and flooding (barrier). - The area has less access to water, which results in ponds drying up earlier even if it is not yet harvest time (barrier). - Stocking many fish can slow the growth rate. (barrier). Taunggyi - It is costlier as the fish fingerlings are big and need more feed. Also, it is difficult to buy fish fingerlings at the right size. Transporting them is also a challenge (barrier). - Farmers worry that predatory fish, snakes, frogs and birds will eat the fish (barrier).	Doers were 3.5 times more likely than Non-Doers to give this response. Non-Doers were 2.8 times more likely than Doers to give this response. Non-Doers were 4.9 times more likely than Doers to give this response. Non-Doers were 3.6 times more likely than Doers to give this response. Doers were 3.3 times more likely than Non-Doers to give this response.	- Reinforce the perception that creating fences, using blue nets, and good pond embankments, will help secure their fish. - Increase the perception that stocking fish fingerlings of the right size ensures that fish will reach marketable size before the ponds dry up (Salin only). - Increase their perception that observing the standard stocking density results in good fish growth (Salin only).	- When monitoring SSA farmers, provide advice on the importance of raising pond embankments, installing water outlets with a sieve and creating fences with blue nets around the pond. - During training, remind farmers to create a water canal to and from the ponds for easier access to water. - Encourage SSA farmers to document monthly fish growth, production and profits, and let them share this information with other farmers to compare performance. - During training sessions, meetings and field visits, compare the results of demonstration ponds with non-demonstration ponds, focusing on fish growth rate and income, including profits. - Disseminate IEC materials and make use of digital platforms to provide key messages on (1) different methods for preventing birds from eating the fish, (2) the importance of using blue nets around pond embankment, reflectors and scare crows, (3) the benefits of observing the correct stocking density, and (4) proper pond preparation and pond management.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Social norms	Salin - Their grandfather disapproves of the behavior (barrier). Taunggyi - Their mother approves of them practicing the behavior (motivator).		- Increase their perception that although their grandfather disapproves of the behavior, other household members, such as their father or wife, approve (Salin only). - Increase their perception that their mother approves of them practicing the behavior (Taunggyi only).	During SSA training sessions, invite key influencers of the priority groups, such as grandfathers, uncles, fathers, wives, and mothers, to talk about the benefits of practicing the behavior.
Access	Salin - It is very difficult (barrier). - It is somewhat difficult (barrier). Taunggyi - It is somewhat difficult (barrier).	Non-Doers were 2.4 times more likely than Doers to give this response. Doers were 2.2 times more likely than Non-Doers to give this response. Non-Doers were 2.7 times more likely than Doers to give this response.	Increase the access of SSA farmers to fish fingerlings at the recommended quantity and size for each production cycle.	- Help set up nursery ponds near or inside the village to access fish fingerlings easily and at a lower price. - Provide links with microcredit institutions for interested fish farmers to help finance inputs.
Cues for action	Salin - They are somewhat difficult (barrier). - They are not difficult at all (motivator). Taunggyi - They are somewhat difficult (barrier).	Non-Doers were 2.2 times more likely than Doers to give this response. Doers were 3.3 times more likely than Non-Doers to give this response.	Increase the ability of SSA farmers to remember to stock their homestead ponds with 3500–5000 fingerlings per acre at the recommended size (3–5 inches) for each production cycle.	- Install IEC materials, such as posters, stickers and tin plates, in visible areas near the pond or fish feed storage areas with key messages on observing the recommended stocking density and size. Create a table of different fish species with correct stocking densities and sizes. - Have the field team remind SSA farmers to stock fish fingerlings at the recommended size and quantity at the start of every production cycle. - Make use of the Shwe Ngar app to send messages to farmers reminding them to practice the behavior.

Determinant	Significant response	Doers vs. Non-Doers	Bridges to activities	Activities
Action efficacy	Salin It is somewhat likely (motivator).		Reinforce the perception that by practicing the behavior it can earn them high income and profits (Salin only).	- Conduct meetings, farmers events and workshops to share the experience of F4L farmers and non-F4L farmers, focusing on a comparison of production rate and growth rate. - Create an online group of SSA farmers, using Facebook, Line or Viber, so that they can share experiences and help identify solutions on issues that they encounter (link to positive consequences).
Divine will	Taunggyi There were equal “yes” and “no” answers.		Decrease their perception that it is Karma that causes them to earn low income or profit (Taunggyi only).	- Create role-playing games during meetings and training sessions, and produce IEC materials that feature a story about a farmer who first believed that Karma caused him to have low income but later learned about the correct stocking density and size of fish fingerlings, which resulted in profits. - Invite religious leaders to speak at meetings and farmers events about the importance of practicing the behavior to earn good income and profits.
Universal motivator	Salin - Farmers want to have a happy, healthy and peaceful family. - They also want to be rich. Taunggyi - Farmers want to have a regular income and job and be successful in both business and agriculture production.		Non-actionable	

Note: For ease and clarity, similar bridges to activities and activities have been combined for both townships.

Table 4. Behavior 2: Stocking fish among SSA farmers in Salin and Taunggyi townships.

7. Conclusion and next steps

The findings from this study will inform the development of key activities, including messages and a behavior change communication strategy. These activities will enable the priority groups to adopt positive nutrition and SSA production behaviors to improve nutrition and increase income among households in F4L *Activity* intervention areas.

The study found the following insights:

- **The priority group had good knowledge on the benefits of eating a variety of foods.** However, there was confusion as to what eating a variety of foods actually entails. Respondents were worried that it implies eating too much food or eating unhealthy food, which is believed to result in dizziness and nausea, among other factors.
- **Lack of money or income** to adopt the behaviors was considered the main barrier among both priority groups.
- **Lack of knowledge on the importance of proper pond preparation** among SSA farmers was highlighted multiple times, as responses indicated that they were worried about predatory fish, snakes and birds eating their fish.
- **Adopting an integrated farming system (fish and vegetable production)** supported food security among SSA farmers, as highlighted in their responses several times, such as more access to fresh fish and dried fish.

Based on feasibility and bearing in mind the current political situation and COVID-19 restrictions, several activities are suggested that can be continued and rolled out in the F4L *Activity* intervention areas. Note that the first two activities were not mentioned in the detailed activity in section 6.3 but are still considered important.

- 1) **Conduct an in-depth qualitative study.** This would contextualize the significant responses among the priority group to provide a better understanding on the situation at the community level. The information would then support the development of the behavior change communication strategy.
- 2) **Develop a behavior change communication strategy.** The strategy would feature a focused approach for conducting activities that promote adoption of behaviors among the priority group. It would serve as a road map of the different communication activities and platforms, such as interpersonal counseling and the radio, that could be undertaken at multiple levels, including individual, community, township and region/state.
- 3) **Strengthen SSA and nutrition training.** Using practical demonstrations (Table 5) and focused messages would strengthen SSA and improve nutrition among both priority groups. Moreover, inviting best-performing SSA farmers and mothers practicing their respective behaviors to share their success/failure stories during the training session would help future participants.

Mothers	SSA farmers
Cooking demonstrations using affordable ingredients that accounts for at least five food groups	Field demonstration on proper pond preparation, fingerling pre-stocking and stocking management, and fish feeding management
Cooking and marketing competitions or games using affordable nutritious foods	Field exposure to households adopting integrated farming system
Fish processing technology on dried fish and smoked fish to increase shelf life	Record keeping on fish growth rate, income and profits
Field exposure to households adopting an integrated farming system to demonstrate vegetable growing	Proper calculation of the feed conversion ratio
Calculating expenses of recipes	Feed formulation
Creating role-playing scenarios that feature stories of good Karma when practicing the behavior	Creating role-plays scenarios that feature stories of good Karma when practicing the behavior

Table 5. Type of sessions in training.

4) Integrate focused behavior messages on IEC materials and mobile application platforms. Use the Shwe Ngar app, Htwet Toe, Greenovator and Facebook to promote the adoption of positive behaviors in multiple languages (Burmese, Shan, Chin) through the following messages:

- Eating diverse food makes you healthy and can help you take care of your children properly.
- Eating more than five of the 10 MDD-W food groups every day makes you feel strong and energetic.
- Proper stocking of fish fingerlings earns you more profit.
- Proper pond preparation keeps predatory fish out of your ponds.

To encourage others, upload videos on mobile platforms that feature stories of good Karma as well as role model SSA farmers and mothers who are practicing the behavior. Moreover, to ensure a wider reach, printed materials should be distributed in public areas where people routinely gather, such as libraries, health clinics, community centers, local markets, pagoda, churches and mosques.

5) Intensify awareness raising events. Conduct nutrition month campaigns, farmers forum/events and workshops in the communities by inviting priority groups as well other household members, such as sisters, aunts, fathers, uncles and religious leaders, to speak about the importance of practicing the behaviors.

6) Strengthen links between different actors. Help farmers access affordable farm inputs (fish fingerlings, feeds, fertilizers) by connecting them with hatchery owners, nursery owners and feed suppliers. In addition, connect mothers with fish producers to increase their ability to access fish at more affordable prices in their area. Furthermore, when applicable, encourage mothers (and families) to adopt integrated farming systems (large fish species + SIS + vegetables and fruits) to increase dietary diversity.

- 7) **Form farmers and mothers groups.** These would include key influencers of the priority group to support mothers and SSA farmers, increase the perception on the importance of consuming diverse foods every day and adhere to the recommended stocking density and size of fish fingerlings during stocking periods. A semi-structured group meeting can help increasing the likelihood of behavior change among the priority groups by sharing information on nutrition for mothers and BAPs for SSA farmers, as well as through experiences (challenges and overcoming barriers) and peer-to-peer counseling.

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Annex 1. Description for DBC framework and barrier analysis study⁸

Definitions of Designing for Behavior Change Framework Terms

Behavior

Action, observable, specific (time, place, quantity, duration, frequency), measurable, feasible, directly contributes to solving the problem (malnutrition, high morbidity, poor harvest).

Defined in positive terms, rather than asking that a group refrain from doing something.
Is done by the Priority Group.

Behavior Statement Formulation

The Priority Group + action verb in present tense + the specifics (time, place, frequency etc.).

Example: Mothers of infants under 6 months old breastfeed them on-demand throughout the day and night, emptying each breast each time.

Priority Group

The group of people who will perform the positive Behavior, or who ensure that the Behavior is practiced by a minor (such as a child). The Priority Group is defined very specifically. For example: farmers whose land is sloped, mothers of infants 0–6 months old.

Influencing Group

The people who influence the Priority Group regarding the Behavior, who can either support or prevent the Priority Group from adopting the positive Behavior.

Always identified by the Priority Group through formative research

Note: Influencing group are the people the *Activity* decides to work with to promote a Behavior who are not identified by the Priority Group are referred to as 'resource' people.

Determinant of Behavior Change

A category of factors shown to motivate or impede the adoption of a Behavior for a given group of people. There are 12 Determinants of behavior change. Self-efficacy, positive consequences, negative consequences, social norms, access, cue for action, susceptibility, severity, action efficacy, Divine will, policy and culture.

Bridges to Activities

Based on the responses given by the Priority Group during formative research

Always about the Priority Group

More-specific descriptions of a change one should make to address the issue revealed by formative research

Usually begins with a directional verb (e.g., increase, decrease, improve, reinforce)

Often proposes to change the perception of the Priority Group

Not expressed in percentages

⁸ From the manual developed by Kittle, Bonnie, (2017) *A Practical Guide to Conducting a Barrier Analysis (2nd ed)*. New York: Helen Keller International

Bridge to Activities Formulation

Directional verb + the perception that... or the ability to... or the availability of...

Example: Increase the perception that sleeping under an insecticide-treated bed net (ITN) is a good way to avoid getting malaria (action efficacy)

Example: Increase the perception that mother's in law approve of only giving infants breastmilk (Social Norms)

Activity

A set of tasks that, when implemented together, will address the Bridges to Activities

Typically start with an action verb

Ideally address more than one Bridge to Activity

Learning About Doer/Non-Doer Studies and Barrier Analysis Surveys

1. How many determinants are explored in Barrier Analysis?

Barrier Analysis asks questions about 5 to 12 behavioral determinants: the four most powerful plus a number of the remaining eight determinants. Some researchers feel it is best to inquire about all of the determinants as possible so as not to miss important factors that may be hampering uptake of the Behavior. It is difficult to know ahead of time which determinants will reveal the most important barriers.

2. Which interview technique is recommended?

Individual interviews with Priority Group members is the recommended interview technique. Previously, focus group discussions were considered an acceptable option, but experience has shown that the results with individual interviews are more reliable.

3. Who is interviewed?

In the Barrier Analysis, the questions are usually asked of individuals from the Priority Group. Their responses are compared based on whether they are Doers or Non-Doers. A person who used to belong to the Priority Group, someone who practiced the Behavior in the past, should be interviewed when the Behavior is time-bound (should be practiced within a specific time period). For example, the respondent for exclusive breastfeeding (breastfeeding during the first 6 months of life) is a mother whose child is 7 months or older).

4. Who interviews Doers and Non-Doers?

Usually *Activity* staff members are trained to conduct the interviews, though outside interviewers can also be engaged to implement the survey. All interviewers should be trained in the Doer/Non-Doer interview methodology as the technique is a bit different from other types of surveys. It is best to have all interviewers interview some Doers and some Non-Doers, rather than having a given interviewer interview only Doers or Non-Doers. This helps to avoid finding trends that are purely a result of how a particular interviewer asked the question or recorded the responses. If you have one person interviewing and one person recording the responses, be sure to have the two swap roles during the survey.

5. Can the same person be interviewed about more than one Behavior during one interview?

If you are conducting more than one Barrier Analysis at the same time, it is best to avoid asking the same person about multiple Behaviors during the same interview. Doing so can lead to over-taxing the respondent and lead to their providing incomplete or not well-thought-out responses as they grow weary of being interviewed.

6. What sample size should be used?

A sample size of 45 individual Doers and 45 individual Non-Doers is recommended, as this usually gives the most actionable results in Barrier Analysis. Keep in mind that because this is qualitative research there is some flexibility with the sample and it's acceptable to interview a few more or less than 45 of each type of respondent (42 Doers 47 Non-Doer, for example). Increasing the sample size over 45 Doers and 45 Non-Doers identifies very small differences between the two groups, which should probably be ignored given their limited correlation with the Behavior.

If you interview less than 45 Doers and 45 Non-Doers, you run the risk of not finding enough important differences between Doers and Non-Doers on which to base your choice of behavior change activities.

If it is impossible to find 45 Doers and 45 Non-Doers, you may still find some significant results. If you cannot find 45 of one group (e.g., Doers), it may be helpful to do twice as many interviews of the other group (e.g., Non-Doers) to find statistically significant differences between the two groups (e.g., interviewing 30 Doers and 60 Non-Doers). When using this approach, the Barrier Analysis Tabulation Sheet (mentioned in question 12) should be used (and not the manual analysis method) to analyze the results. When introducing a Behavior that is new to an area (e.g., solar water disinfection, use of Zinc), you may not find any Doers at the beginning of the intervention. In this case, the Barrier Analysis Study is not your best choice and you should consider other formative research approaches such as Trials of Improved Practices (TIPS).

7. What type of sampling should be used?

The Barrier Analysis is a qualitative method that uses purposive or convenience sampling. When choosing your sample, it is important to consider key differences between groups, and ensure that those differences are represented. In order for your results to reflect those key differences in the population, it is good to draw your respondents from different communities. This is particularly true if your community is not very homogenous. For example, if there are different religious or ethnic groups or if there are other issues *that may impact the practice of the Behavior* (e.g., geography in the case of care seeking), these also should be taken into consideration. For example, in order to interview 45 Doers and 45 Non-Doers, you might consider interviewing five Doers and five Non-Doers from each of nine different communities, rather than selecting them all from the same community. (If you are concerned that there may be major differences between certain groups, such as men and women, consider conducting completely separate BA surveys among those groups. *You should only do this, however, if you are able to create different activities for each group based on your results. Similarly, only conduct separate full BA studies in different geographical areas if the intervention has the resources to develop different behavior change strategies in each separate area.*

8. How long does a typical Barrier Analysis take?

With a team of 15–20 interviewers and supervisors a Barrier Analysis study (all 7 steps) on one Behavior can usually be completed in two weeks. This includes writing and pre-testing the questionnaire, translating the questionnaire (the most time-consuming task), training your interviewers and supervisors (one day), organizing the field work, conducting the 90 interviews (½ day), coding, tabulating and analyzing the data (½ day). This assumes that the communities to be visited are reasonably accessible (1-2 hour's drive) and that the respondents can be easily found.

9. When in the Activity life cycle should Barrier Analysis be used?

Barrier Analysis can be used at *Activity* start-up (e.g., prior to detailed implementation planning), which is the ideal time to plan a behavior change strategy, or at midterm or final evaluation for an *Activity* that will have a follow-on, if a behavior change strategy is needed or needs adjustment at that time. In addition, some organizations conduct a Barrier Analysis studies periodically to research several Behaviors over the course of an intervention (e.g. Food for the Hungry sometimes conducts a Barrier Analysis on key Behaviors they intend to promote through Care Groups before each Behavior promotion module is finalized).

10. How reliable are the findings?

The responses found to be significant on a Barrier Analysis study have less than a 5 percent probability of being due to chance (hence there is a 95% validity rate). Because the Barrier Analysis identifies important differences between Doers and Non-Doers, it is very probable that the responses with a 15-percentage point gap or more are *true* differences; not just due to chance.

11. How are results analyzed?

A questionnaire is developed and administered to Doers and Non-Doers, usually members of the Priority Group. The results are coded and tabulated manually on flip charts, and the percentage is calculated using a simple calculator. Those responses with a 15-point difference or higher indicate the most significant responses. It is important to note that the percentages of Doers or Non-Doers giving a particular response alone (or even the total combined) are not meaningful; it's the difference between the two groups that matters. Also, sometimes a minority of Doers and Non-Doers will give a particular response, but the difference between them is large enough to indicate an important determinant.

The results also can be entered into a MS Excel table specially created for finding differences between Doers and Non-Doers. The MS Excel spreadsheet calculates the percentages of Doers and Non-Doers who gave each response and identifies important differences. Because the spreadsheet is more sensitive sometimes the number of significant differences may be different from the manual method. The spreadsheet also shows the magnitude of the difference of each response (e.g., Doers were 7 times more likely to say that their husbands approved of the Behavior than Non-Doers). The MS Excel spreadsheet can be downloaded (as of March 2016) from: <http://caregroups.info/wp-content/uploads/2015/08/1Final-Computerized-Tabulation-Sheets-June-2016.xlsx>

A document explaining how to use the Barrier Analysis Tabulation Sheet can be found at: <http://caregroups.info/wp-content/uploads/2016/06/Final-Computerized-Tabulation-Instructions-June-2016.docx>

12. Are other qualitative methods sometimes used after a Barrier Analysis?

Occasionally other qualitative methods are used to follow-up after a Barrier Analysis. For example, if we learn from a question about social norms that mothers feel that their husbands don't approve of something, it's important to verify if that perception is correct. In that case a few group interviews with a sample of those husbands should be conducted to see how they actually feel about the desired Behavior and if they approve of their wife adopting it. Similarly, if respondents say there is a policy or a cultural taboo that makes it hard to practice the Behavior, you might have to investigate what that policy or cultural taboo is. When a Barrier Analysis is not possible due to a lack of Doers, using Trials of Improved Practices (TIPS), focus group discussions, Participatory Learning and Action (PLA), and other qualitative methods can be used to identify enablers and barriers. Follow this link to find a document that describes many different kinds of formative research techniques.

<http://www.fsnnetwork.org/formative-research-guide-support-collection-and-analysis-qualitative-data-integrated-maternal-and>

13. Is Barrier Analysis a quantitative method or qualitative method?

Barrier Analysis is a qualitative type of research but uses a quantitative approach to analyze the data. The questionnaire has open-ended questions that help explore and describe how the two groups think (which makes them qualitative in nature), but it uses quantitative elements (e.g. the comparison of Doers and Non-Doers) that allow us to express the results in quantitative fashion. It's important to remember, however, that because of the type of sampling used, Barrier Analysis cannot measure the *prevalence* of a particular belief.

Annex 2. Important Determinants that Influence Behavior^{9,10}

The first four determinants should always be explored when conducting formative research (e.g., Barrier Analysis or Doer/Non-Doer Studies). These four are more commonly found to be the most important for health/nutrition Behaviors.

1. Perceived self-efficacy/skills

- The Priority Group member's belief that s/he can do the Behavior given his/her current knowledge, skills and resources

2. Perceived social norms

- The perception that people important to the Priority Group think that s/he should do the Behavior or should not do the Behavior
- Social Norms has two parts: 1) who matters most to the Priority Group member regarding a particular Behavior and 2) what the Priority Group member perceives those people think s/he should do
- Response to the questions on Social Norms reveals the Influencing Group. There is usually only 1 (sometimes 2) influencing group and it is usually someone close to the Priority Group, like a family member

3. Perceived positive consequences

- What positive things the Priority Group member thinks will happen as a result of practicing a Behavior
- There is an overlap between Positive Consequences and Action Efficacy when the Priority Group cites as an advantage of doing the Behavior that it will prevent the problem (e.g. a benefit of handwashing with soap at the critical times is that I won't get diarrhea)
- Not all positive consequences relate to preventing the problem, however. (e.g. If I sleep under a mosquito net I won't be bothered by mosquitos humming in my ears all night.)

4. Perceived negative consequences

- The negative things the Priority Groups thinks will happen as a result of performing a Behavior
- Responses to questions related to negative consequences reveal disadvantages of the Behavior, attitudes about the Behavior, and perceived negative attributes of the Behavior

⁹ This list of determinants has been reworked since the Designing for Behavior Change training curriculum was first published in 2008 to better fit agriculture and natural resource management (NRM) Behaviors and is somewhat different from the list of determinants used in the 2008 health and nutrition-focused Barrier Analysis manual.

¹⁰ This handout is adapted from materials originally developed by AED and from the Food for the Hungry Barrier Analysis manual.

Other Key Determinants

5. Access

- Includes the degree of availability (to a particular Priority Group) of the needed products (e.g., fertilizer, soap, condoms) or services (e.g., veterinary services, immunizations) required to adopt a given Behavior
- Includes barriers related to cost, geography, distance, language, cultural issues, and gender
- Access issues can also be revealed by responses given to the Self-Efficacy question – What makes it difficult? Not having improved seeds or the health center is too far away.

6. Cues for action

- The perception of the Priority Group that they can remember to do a particular Behavior
- The perception of the Priority Group that they can remember **how** (the steps required) to do a particular Behavior
- Key powerful events that triggered a behavior change in a person (e.g., there was a fatal road accident here, so I remember that I should slow down when I get to this part of the road)

7. Perceived susceptibility/risk

- The Priority Group member's perception of how vulnerable or at-risk s/he feels to the problem (e.g., how likely is it that my crop will get cassava wilt? How likely is it that my child will become malnourished?)

8. Perceived severity

- The Priority Group member's belief that the problem (which the Behavior can prevent) is serious (e.g., Is soil erosion a serious problem for me? How serious is diarrhea?)

9. Perceived action efficacy

- The belief that by practicing the Behavior one will avoid the problem; that the Behavior is effective in avoiding the problem (e.g., if I sleep under a mosquito net, I won't get malaria)
- There is an overlap between Action Efficacy and Positive Consequences when the Priority Group cites as an advantage that doing the Behavior will prevent the problem.

Note: Perceived susceptibility/risk and perceived severity (relate to the problem). Perceived action efficacy links the problem to the Behavior. In order to study issues around susceptibility, severity, and action efficacy, you must know what the problems are that the Behavior addresses. Divine will can sometime also be about the problem, depending on how you phrase the question (e.g., Does God cause children to become malnourished?).

10. Perceived Divine will¹¹

- The Priority Group's perception that their religion or God approves of the Behavior
- The Priority Group member's belief that it is God's will for him/her to have the problem and/or to overcome it
- Divine will can also refer to the Priority Group member's perception about the spirit world or magic (e.g., whether or not the problem was caused by an evil spell or curse)

11. Policy

- The existence of laws and regulations (local, regional, or national) that hinder or facilitate the adoption of the Behavior (e.g., the presence of good land title laws may make it more likely that a person take steps to improve their farm land, the Baby-Friendly Hospital policy that forbids the distribution of formula (even if it's free) in order to promote breastfeeding]

12. Culture

- The perception of the Priority Group member that the group to which they belong is allowed or not permitted by the society to practice the Behavior.
- The belief that certain Behaviors are not acceptable for certain people (e.g., boys do not collect and carry water – only girls/women do that job, mothers of newborns cannot leave the house for 40 days after the birth).
- May be associated with ethnicity or lifestyle, such as homosexual/gay or youth culture

13. Universal Motivators

- Factors that have been found to motivate most people, irrespective of other variables
- Usually used in mass media activities (e.g., billboards, posters, public service announcements)
- Include love, security, comfort, recognition, success, freedom, positive self- image, social acceptance, peace of mind, status, pleasure, and power

¹¹ Numerous unpublished Barrier Analysis studies have found this determinant to be important for many Behaviors (particularly for health and nutrition Behaviors)

Annex 3. Questionnaires used for the BA Study

LANGUAGE: Burmese (Myanmar)

Group: ☐ Doer ☐ Non-Doer

Barrier Analysis Questionnaire: Consumption of diverse foods among mothers of under 5-year-old children

Behaviour Statement

အသက် ၅ နှစ်အောက် ကလေးမိခင်များသည် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို နေ့စဉ် စားသုံးသည်။

Mothers of under 5-year-old children consume at least 5 food groups out of 10 food groups every day

Demographic Data

Name: _____ No.: _____

Date ____/____/____

Community: _____

Scripted Introduction:

မင်္ဂလာပါ။ ကျွန်တော်/မ နာမည်ကတော့ ----- ဖြစ်ပါတယ်။ USAID မှ ရန်ပုံငွေပံ့ပိုးသော ဝင်ငွေတိုး ငါးမွေးမြူရေးစီမံကိန်း ကို အကောင်အထည်ဖော်နေတဲ့ WorldFish ရဲ့ မိတ်ဖက်အဖွဲ့အစည်း ----- အဖွဲ့က ဖြစ်ပါတယ်။ အစ်မနဲ့ အစားအစာအလေ့အထအကြောင်း ဆွေးနွေးချင်လို့ပါ။ မိနစ်(၂၀) လောက်ကြာမှာ ဖြစ်ပါတယ်။ အစားအစာအလေ့အထနဲ့ပတ်သက်ပြီး အစ်မရဲ့အမြင်ကို ကြားလိုပါတယ်။ ကျွန်တော်/မ တို့ဆွေးနွေးတဲ့ အကြောင်းအရာတွေကို လျှို့ဝှက်ထားမှာ ဖြစ်ပြီး အခြား ဘယ်သူ့ကိုမှ ပြောပြမှာ မဟုတ်ပါဘူး။ အစ်မ အနေနဲ့ ဆွေးနွေးချင်ပါသလား။

(မဆွေးနွေးချင်လည်း အချိန်ပေးတဲ့အတွက် ကျေးဇူးတင်ကြောင်း ပြောပြပါ။)

Hi, my name is _____; and I am from _____ (NGO name) working in partnership with WorldFish under Fish for Livelihoods activity funded by USAID. I would like to discuss about your eating habits and your views on this topic, this will take about 20 minutes of your time. This is voluntary participation and you will not be remunerated nor receive any gifts from us. If you decide not to join, that is fine and it will not affect your relationship with the project. The responses you provide is strictly confidential and will not be shared with anyone else.

Section A. Behavior Screening

1. အစ်မရဲ့ အငယ်ဆုံးကလေး အသက် ဘယ်လောက်ရှိပြီလဲ။ _____ လ (လဖြင့်ရေးပါ။)
 - a. ၅ နှစ်အောက်
 - b. ၅ နှစ်အထက် → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။
 - c. မသိပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။

1. How old is your youngest child? (Write the age in months)
 - a. < 5 years old
 - b. > 5 years old → end and look for another respondent
 - c. Don't know → end and look for another respondent

2. မနေ့က (လွန်ခဲ့သော ၂၄ နာရီ) အမ ဘာဟင်းတွေနဲ့ စားခဲ့လဲ ပြန်စဉ်းစားစေချင်ပါတယ်။
ဟင်းဘယ်နှစ်မျိုးစားခဲ့လဲ။ (ဤမေးခွန်းသည် မိခင်စားခဲ့သည့်ဟင်းများကို အမှတ်ရစေရန် ကူညီပေးဖို့ ဖြစ်ပါသည်။)
 - a. _____
 - b. မသိပါ။/မဖြေပါ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။

2. I would like you to think about all the meals you ate yesterday (past 24 hours).
How many meals did you eat? (This question is just to help the mother remember what she ate.)
 - a. _____
 - b. Do not know/no response → end and look for another respondent

3. အစ်မ မနေ့က (လွန်ခဲ့သည့် ၂၄ နာရီ) စားခဲ့တဲ့ မှတ်မိတဲ့ အစားအစာ အမျိုးမျိုးကို ပြောပြပါ။
(အကယ်၍ မိခင်သည် ဟင်းလျာအကြောင်းပြောပါက ပါဝင်တဲ့အမျိုးအမည်များကို ချရေးပါ။ မိခင် ပြောပြသည့် အောက်ဖော်ပြပါ အစားအစာ အကွက်များအားလုံးကို အမှန်ဖြစ်ပါ။)
 - a. မသိပါ။/မဖြေပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။
 - b. ဆန်၊ ဂျုံ၊ ပြောင်း၊ အဖြူရောင် သစ်မြစ်များ၊ သစ်ဥများ (အာတာလွတ်ဥ၊ ကန်စွန်းဥ၊ ပိန်းဥ၊ အာလူး)
 - c. ပဲမျိုးစုံ (ပဲအခြောက် နှင့် ပဲဟင်း၊ ပဲနို့၊ တိုဖူး၊ ပဲပြား)
 - d. အခွံမာသီး နှင့် အစေ့များ (နှမ်း၊ သစ်ကျားသီး၊ နေကြာစေ့)
 - e. နို့ထွက်ပစ္စည်းများ (ဒိန်ခဲ၊ နွားနို့၊ ထောပတ်)
 - f. ငါး၊ အသား နှင့် ကြက်သား
 - g. ဥများ
 - h. အစိမ်းရင့်ရောင်အရွက်များ (ကန်စွန်းရွက်၊ ဟင်းနုနွယ်၊ ကိုက်လန်)
 - i. အခြားသော ဗီတာမင် A ကြွယ်ဝသည့် သစ်သီးဝလံနှင့်ဟင်းသီးဟင်းရွက်များ
(သဘောသီးမှည့်၊ မုန်လာဥနီ၊ ရွှေဖရုံသီး၊ သရက်သီးမှည့်၊ ရွှေကန်စွန်းဥ)
 - j. အခြားသော ဟင်းသီးဟင်းရွက်များ
 - k. အခြားသော သစ်သီးဝလံများ (ထောပတ်သီး)

3. Please tell me all the different foods you remember eating yesterday (past 24 hours).
(If the mother mentions a dish that has several ingredients, ask her to list them all. Check all the boxes of foods the mother mentions.)

- a. Don't know/no response → *end and look for another respondent*
- b. Grains, white roots and tubers and plantains
- c. Pulses (beans, peas and lentils)
- d. Nuts and seeds
- e. Dairy products
- f. Fish, Meat and poultry
- g. Eggs
- h. Dark green leafy vegetables
- i. Other vitamin A-rich fruits and vegetables
- j. Other vegetables
- k. Other fruits

Doer (all of the following)	Non-Doer (any one of the following)	Do not interview (any one of the following)
Question 1 – A		Question 1 – B or C
Question 2 – A		Question 2 – B
Question 3 – 5 boxes checked from B to K.	Question 3 – Less than 5 boxes checked from B to K.	Question 3 – A

GROUP: ☐ Doer ☐ Non-Doer

Behavior Explanation: အစားအစာအုပ်စု ၁၀ ခု နှင့်ပတ်သက်၍ အမျိုးသမီးလမ်းညွှန်များ အတွက် ညွှန်ပြထားသည့် အနည်းဆုံး အစားအစာအမျိုးမျိုးစားသုံးခြင်းအကြောင်းကို အကျဉ်းချုပ် ရှင်းပြပါ။
အစားအစာအုပ်စုတွင် (၁) အစေ့များ၊ အဖြူရောင် သစ်မြစ်များ၊ သစ်သီး/သစ်ဥများ၊ (၂) ပဲမျိုးစုံ (ပဲသီး၊ ပဲ နှင့် ပဲဟင်း)၊ (၃) အခွံမာသီး နှင့် အစေ့များ၊ (၄) နို့ထွက်ပစ္စည်းများ၊ (၅) ငါး၊ အသား နှင့် ကြက်သား၊ (၆) ဥများ၊ (၇) အစိမ်းရင့်ရောင်အရွက်များ၊ (၈) အခြားသော ဗီတာမင် A ကြွယ်ဝသည့် အသီးအနှံနှင့်ဟင်းသီးဟင်းရွက်များ၊ (၉) အခြားသော ဟင်းသီးဟင်းရွက်များ၊ (၁၀) အခြားသော အသီးအနှံများ ပါဝင်သည်။

Briefly explain about the ten food groups as indicated in the minimum dietary diversity for women guide and make sure she understands the idea of grouping different foods. The food groups include (1) Grains, white roots and tubers and plantains, (2) Pulses (beans, peas, lentils) (3) Nuts and seeds, (4) Dairy products, (5) Fish, meat and poultry, (6) Eggs, (7) Dark green leafy vegetables, (8) Other vitamin A rich fruits and vegetables, (9) other vegetables, (10) other fruits.

အောက်ပါမေးခွန်းများသည် ကျွန်တော် ပြောပြခဲ့သည့် အစားအစာအုပ်စု (၁၀) ခု အကြောင်းကို ပြောသွားမည်ဖြစ်သည်။ ကျေးဇူးပြု၍ အင်တာဗျူးတွင် တိုးတက်မှုများကို မှတ်သားထားပါ။

In the following questions I am going to be talking about the ten food groups that I



Section B –

(Perceived Self-efficacy)

1. အစ်မရဲ့ လက်ရှိ အသိပညာ၊ ဗဟုသုတတွေနဲ့ **အစားအစာအုပ်စု** (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို နေ့စဉ် **စားသုံးဖို့** အဆင်ပြေမယ်လို့ ထင်ပါသလား။

- a. ထင်တယ်
- b. မထင်ဘူး
- c. ပြေကောင်းပြေနိုင်မယ်။

1. With your current knowledge, skills and resources do you think you can consume at least 5 out of 10 food groups every day?

- a. Yes
- b. No
- c. Maybe

2a. **Doers:** **အစားအစာအုပ်စု** (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို နေ့စဉ် **စားသုံးရတာဘာကြောင့်** အဆင်ပြေတာလဲ။

2b. **Non-doers:** **အစားအစာအုပ်စု** (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို နေ့စဉ် **စားသုံးဖို့အတွက်** ဘာကြောင့် **အဆင်ပြေမယ်ထင်လဲ။**

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

2a. **Doers:** What makes it **easier** for you to consume at least 5 out of 10 food groups every day?

2b. **Non-doers:** What would make it **easier** for you to consume at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "What else?")

(Perceived Self-efficacy)

3a. **Doers:** **နေ့စဉ် အစားအစာအုပ်စု** (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို **စားဖို့** ဘယ်လိုအခက်အခဲတွေရှိသလဲ။

3b. **Non-doers:** **နေ့စဉ် အစားအစာအုပ်စု** (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို **စားမယ်ဆိုရင်** ဘယ်လိုအခက်အခဲတွေရှိမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

3a. **Doer:** What makes it **difficult** for you to consume at least 5 out of 10 food groups every day?

3b. **Non-Doer:** What would make it **difficult** for you to consume at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "What else?")

(Perceived Positive Consequences)

5a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားတဲ့အတွက် ဘယ်လို အကျိုးကျေးဇူးတွေရသလဲ။

5b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားမယ်ဆိုရင် ဘယ်လို အကျိုးကျေးဇူးတွေရမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

4a. **Doer:** What are the **advantages** of consuming at least 5 out of 10 food groups every day?

4b. **Non-Doer:** What would be the **advantages** of consuming at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "What else?")

(Perceived Negative Consequences)

5a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားတဲ့အတွက် ဘယ်လိုဆိုးကျိုးတွေရှိသလဲ။

5b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားမယ်ဆိုရင် ဘယ်လိုဆိုးကျိုးတွေရှိမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

5a. **Doer:** What are the **disadvantages** of consuming at least 5 out of 10 food groups every day?

5b. **Non-Doer:** What would be the **disadvantages** of consuming at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "What else?")

(Perceived Social Norms)

6a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားတာကို ဘယ်သူတွေက အားပေးသလဲ။

6b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားမယ်ဆိုရင် ဘယ်သူတွေက အားပေးမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

6a. **Doer:** Who are the people that **approve** of you consuming at least 5 out of 10 food groups every day?

6b. **Non-Doer:** Who are the people that **would approve** of you consuming at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "What else?")

7a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားတာကို အားမပေးတာ ဘယ်သူတွေလဲ။

7b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားမယ်ဆိုရင် အားမပေးတာ ဘယ်သူတွေဖြစ်မယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

7a. **Doer:** Who are the people that **disapprove** of you consuming at least 5 out of 10 food groups every day?

7b. **Non-Doer:** Who are the people that **would disapprove** of you consuming at least 5 out of 10 food groups every day?

(Write all responses below. Probe with "Who else?")

(Perceived Access)

8a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားဖို့အတွက် အစားအစာ အမျိုးအမျိုးရရှိ ဘယ်လောက်ခက်သလဲ။ အရမ်းခက်သလား၊ နည်းနည်းခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

8b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားဖို့အတွက် အစားအစာ အမျိုးအမျိုးရရှိ ဘယ်လောက်ခက်မယ်ထင်သလဲ။ အရမ်းခက်သလား၊ နည်းနည်းခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

a. အရမ်းခက်တယ်။

b. နည်းနည်းခက်တယ်။

c. လုံးဝမခက်ပါဘူး။

8a. **Doer:** How difficult is it to get the variety of foods to consume 5 out of 10 food groups every day? Would you say it is very difficult, somewhat difficult or not difficult at all?

8b. **Non-Doer:** How difficult would it be to get the variety of foods to consume 5 out of 10 food groups every day? Would you say it is very difficult, somewhat difficult or not difficult at all?

a. Very difficult

b. Somewhat difficult

c. Not difficult at all.

(Perceived Cues for Action/Reminders)

9a. **Doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားဖို့အတွက် သတိရဖို့ ဘယ်လောက်ခက်သလဲ။ အရမ်းခက်သလား၊ နည်းနည်းခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

9b. **Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားဖို့အတွက် သတိရဖို့ ဘယ်လောက်ခက်မယ်ထင်သလဲ။ အရမ်းခက်မလား၊ နည်းနည်းခက်မလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

a. အရမ်းခက်တယ်။

b. နည်းနည်းခက်တယ်။

c. လုံးဝမခက်ပါဘူး။

9a. **Doer:** How difficult is it to remember to consume at least 5 out of 10 food groups every day? Very difficult, somewhat difficult, or not difficult at all?

9b. **Non-Doer:** How difficult do you think it would be to remember to consume at least 5 out of 10 food groups every day? Very difficult, somewhat difficult, or not difficult at all?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Susceptibility/Perceived Risk)

10. **Doers and Non-doers:** မပြောကောင်း မဆိုကောင်း လာမယ့် ၃ လအတွင်းမှာ အစ်မ

ကျန်းမာရေးနှင့် အာဟာရဆိုင်ရာ ပြဿနာများဖြစ်တဲ့ သွေးအားနည်းတာ၊ အားနည်းတာ၊

ခြေလက်ထုံကျဉ်ကိုက်ခဲတာ၊ မောပန်းတာ ဖြစ်နိုင်ခြေ ဘယ်လောက်ရှိမယ်ထင်သလဲ။ ဖြစ်နိုင်ခြေ

အများကြီးရှိသလား။ ဖြစ်နိုင်ခြေ နည်းနည်းရှိသလား သို့မဟုတ် ဖြစ်နိုင်ခြေလုံးဝမရှိဘူးလား။

- a. ဖြစ်နိုင်ခြေအများကြီးရှိတယ်။
- b. ဖြစ်နိုင်ခြေနည်းနည်းရှိတယ်။
- c. ဖြစ်နိုင်ခြေလုံးဝမရှိပါ။

10. How likely is it that you will get health/nutritional problems such as anemia, weakness, tingling and numbness of feet and fingers, fatigue, etc. in the coming 3 months? Very likely, somewhat likely, or not likely at all?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perceived Severity)

11. **Doers and Non-doers:** မပြောကောင်း မဆိုကောင်း တကယ်လို့ အစ်မ ကျန်းမာရေးနှင့်

အာဟာရဆိုင်ရာ ပြဿနာများဖြစ်တဲ့ သွေးအားနည်းတာ၊ အားနည်းတာ၊ ခြေလက်ထုံကျဉ်ကိုက်ခဲတာ၊

မောပန်းတာဖြစ်ရင် ဘယ်လောက်ထိ ဆိုးမယ်ထင်သလဲ။ အရမ်းဆိုးနိုင်သလား၊

သိပ်မဆိုးလောက်ဘူးလား သို့မဟုတ် လုံးဝ မဆိုးလောက်ဘူးလား။

- a. အရမ်းဆိုးနိုင်တယ်။
- b. သိပ်မဆိုးလောက်ပါဘူး။
- c. လုံးဝ မဆိုးလောက်ပါဘူး။

11. How serious would it be if you have health/nutritional problems such as anemia, weakness, tingling and numbness of feet and fingers, fatigue, etc.? A very serious problem, somewhat serious problem, or not serious at all?

- a. Very serious problem
- b. Somewhat serious problem
- c. Not serious at all

(Action Efficacy)

11. **Doers and Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားရင် ကျန်းမာရေးနှင့် အာဟာရဆိုင်ရာ ပြဿနာများဖြစ်တဲ့ သွေးအားနည်းတာ၊ အားနည်းတာ၊ ခြေလက်ထုံကျဉ်ကိုက်ခဲတာ၊ မောပန်းတာ ဖြစ်နိုင်ခြေဘယ်လောက်ရှိမယ်ထင်သလဲ။
အရမ်းဖြစ်နိုင်ခြေရှိလား။ ဖြစ်နိုင်ခြေသိပ်မရှိဘူးလား သို့မဟုတ် ဖြစ်နိုင်ခြေလုံးဝမရှိဘူးလား။
- a. ဖြစ်နိုင်ခြေအများကြီးရှိတယ်။
 - b. ဖြစ်နိုင်ခြေသိပ်မရှိဘူး။
 - c. ဖြစ်နိုင်ခြေလုံးဝမရှိပါ။

12. How likely is it that you will have nutritional/ health problems such as anemia, weakness, tingling and numbness of feet and fingers, fatigue, etc. if you consume at least 5 out of 10 food groups every day? Very likely, somewhat likely, not very likely?
- a. Very likely
 - b. Somewhat likely
 - c. Not likely at all

(Perception of Divine Will)

12. **Doers and Non-doers:** အစ်မ ကျန်းမာရေးနှင့် အာဟာရဆိုင်ရာ ပြဿနာများဖြစ်တဲ့ သွေးအားနည်းတာ၊ အားနည်းတာ၊ ခြေလက်ထုံကျဉ်ကိုက်ခဲတာ၊ မောပန်းတာ ဖြစ်တာ အစ်မရဲ့ ကံတရားကြောင့် / ဘုရားသခင်ရဲ့အလိုတော်ကြောင့်လို့ထင်သလား။
- a. ထင်တယ်။
 - b. မထင်ပါဘူး။
 - c. မသိပါ/မဖြေပါ။

13. Do you think it's Karma that causes you to have nutritional/ health problems such as anemia, weakness, tingling and numbness of feet and fingers, fatigue, etc?
(Do you think that its God/demon will that you have nutritional/ health problems such as anemia, weakness, tingling and numbness of feet and fingers, fatigue, etc?)
- a. Yes
 - b. No
 - c. Don't know/Won't say

(Culture)

13. **Doers and Non-doers:** နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စု စားတာကို ရှောင်ကြဉ်ခိုင်းတဲ့ ဓလေ့ထုံးစံ သို့မဟုတ် အယူအစွဲတွေ အစ်မတို့ရဲ့ ရပ်ရွာမှာ ရှိသလား။
- a. ရှိတယ်။
 - b. မရှိဘူး။
 - c. မသိပါ/မဖြေပါ။

13. Are there any cultural rules or taboos against consuming at least 5 out of 10 food groups every day??
- a. Yes
 - b. No
 - c. Don't know/Won't say

(Policy)

14. **Doers and Non-doers:** အစ်မတို့ရဲ့ ရပ်ရွာမှာ နေ့စဉ် အစားအစာအုပ်စု (၁၀) အုပ်စုမှ အနည်းဆုံး (၅) အုပ်စုကို စားဖို့ ချမှတ်ထားတဲ့ ဥပဒေ (သို့) စည်းမျဉ်းစည်းကမ်းတွေ ရှိသလား။

- a. ရှိတယ်။
- b. မရှိဘူး။
- c. မသိပါ/မဖြေပါ။

14. Are there any community laws or rules in place that make it more likely that you consume at least 5 out of 10 food groups every day??

- a. Yes
- b. No
- c. Don't know/Won't say

(Universal Motivators)

15. **Doers and Non-doers:** အစ်မကို အစားအစာအမျိုးအမျိုးစားသုံးခြင်းနဲ့ မဆိုင်တဲ့ မေးခွန်း တစ်ခု မေးမယ်နော်။ အစ်မဘဝမှာ အဖြစ်ချင်ဆုံးဆန္ဒတစ်ခုက ဘာလဲ။

15. Now I am going to ask you a question unrelated to consumption of diverse foods. What is your desire in life?

အခုလိုအချိန်ပေးတဲ့အတွက် ကျေးဇူးတင်ပါတယ်။
Thank the respondent for her time!

Barrier Analysis Questionnaire: Stocking of fish fingerlings in recommended size and quantity per pond

Demographic Data

Behaviour Statement

ဝင်ငွေတိုးငါးမွေးမြူရေးစီမံကိန်း၏ တပိုင်တနိုင်ငါးမွေးတောင်သူများသည်
မိမိတို့ အိမ်ခြံလမ်းအတွင်းရှိ ငါးမွေးကန်တွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ
၃,၅၀၀-၅,၀၀၀ (၃"- ၅") နှုန်းဖြင့် ငါးမွေးရာသီတိုင်းတွင် ထည့်သွင်းမွေးမြူသည်။

Small Scale Aquaculture (SSA) farmers of Fish for Livelihoods Activity stock their homestead ponds with 3,500-5,000 fingerlings (3"- 5") per acre in every production cycle.

Name: _____ No.: _____

Date ____/____/____

Community: _____

Scripted Introduction:

မင်္ဂလာပါ။ ကျွန်တော်/မ နာမည်ကတော့ ----- ဖြစ်ပါတယ်။ USAID မှ ရန်ပုံငွေပံ့ပိုးသော ဝင်ငွေတိုး ငါးမွေးမြူရေးစီမံကိန်း ကို အကောင်အထည်ဖော်နေတဲ့ WorldFish ရဲ့ မိတ်ဖက်အဖွဲ့အစည်း ----- အဖွဲ့က ဖြစ်ပါတယ်။ အစ်ကို/အစ်မနဲ့ ငါးသားပေါက်ထည့်သွင်းမွေးမြူတဲ့အလေ့အကျင့်အကြောင်း ဆွေးနွေးချင်လို့ပါ။ မိနစ် (၂၀) လောက်ကြာမှာ ဖြစ်ပါတယ်။ ငါးသားပေါက်ထည့်သွင်း မွေးမြူတဲ့ အလေ့အကျင့်နဲ့ပတ်သက်ပြီး အစ်ကို/အစ်မရဲ့ အမြင်ကို ကြားလိုပါတယ်။ ကျွန်တော်/မ တို့ ဆွေးနွေးတဲ့ အကြောင်း အရာတွေကို လျှို့ဝှက်ထားမှာ ဖြစ်ပြီး အခြား ဘယ်သူ့ကိုမှ ပြောပြမှာ မဟုတ်ပါဘူး။ အစ်ကို/အစ်မ အနေနဲ့ ဆွေးနွေးချင်ပါသလား။

(မဆွေးနွေးချင်လည်း အချိန်ပေးတဲ့အတွက် ကျေးဇူးတင်ကြောင်း ပြောပြပါ။)

Hi, my name is _____; I am from _____ (NGO name) working in partnership with WorldFish under Fish for Livelihoods activity funded by USAID. I would like to discuss with you about your practice and your views of stocking fingerlings in your ponds which will take about 20 minutes. This is voluntary participation and you will not be remunerated nor receive any gifts from us. If you decide not to join, that is fine and it will not affect your relationship with the project. The response you provide is held strictly confidential and will not be shared with anyone else.

Section A. Behavior Screening

1. အစ်ကို / အစ်မရဲ့ ငါးမွေးကန်ထဲကို ဘယ်အချိန်မှာ ငါးသားပေါက်ထည့်သွင်းမွေးမြူခဲ့သလဲ။
 - a. ငါးမွေးတဲ့ ရာသီတိုင်း
 - b. ငါးမွေးတဲ့ တစ်ရာသီသာ
 - c. မသိပါ/မမှတ်မိပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။
1. When did you stock fingerlings in your homestead pond?
 - a. During this year
 - b. Within the previous cycle
 - c. Do not know/ Can't remember → End interview and find another respondent
2. အစ်ကို / အစ်မရဲ့ ငါးမွေးကန်ထဲကို ငါးသားပေါက် ဘယ်အမျိုးအစား ထည့်သွင်းမွေးမြူခဲ့သလဲ။
 - a. ရွှေဝါငါးကြင်း၊ မြက်စားငါးကြင်း
 - b. ငါးမြစ်ချင်း၊ ထိုင်းငါးနံးမ
 - c. မသိပါ/မမှတ်မိပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။
2. What fingerlings did you stock in your homestead pond?
 - a. Common Carp, grass Carp (Taungyi)
 - b. Rohu, Silver Barb (Salin)
 - c. Do not know/ Can't remember → End interview and find another respondent
3. အစ်ကို / အစ်မရဲ့ ငါးမွေးကန်ကို တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ဘယ်လောက်ထည့်ခဲ့သလဲ။
 - a. တစ်ဧကလျှင် ကောင်ရေ ၃၅၀၀-၅၀၀၀
 - b. တစ်ဧကလျှင် ကောင်ရေ ၅၀၀၀ အထက် → *Non-doer* ဟုမှတ်သားပြီး Section B သို့သွားပါ။
 - c. တစ်ဧကလျှင် ကောင်ရေ ၃၅၀၀ အောက် → *Non-doer* ဟုမှတ်သားပြီး Section B သို့သွားပါ။
 - d. မသိပါ/မမှတ်မိပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။
3. How many fingerlings did you put/stock per acre in your homestead ponds? -
 - a. 3500-5000 fingerlings per acre
 - b. >5,000 fingerlings per acre → Mark as Non-doer and continue to Section B
 - c. < 3,500 fingerlings per acre → Mark as Non-doer and continue to Section B
 - d. Do not know/ Can't remember → End interview and find another respondent
4. မည်မျှရှိသည့် ငါးသားပေါက်အရွယ်အစားကို ထည့်သွင်းမွေးမြူခဲ့သလဲ။
 - a. (၃ - ၅) လက်မ
 - b. ၅ လက်မ အထက် → *Non-doer* ဟုမှတ်သားပြီး Section B သို့သွားပါ။
 - c. ၃ လက်မ အောက် → *Non-doer* ဟုမှတ်သားပြီး Section B သို့သွားပါ။
 - d. မသိပါ/မမှတ်မိပါ။ → အဆုံးသတ်ပြီး ဖြေဆိုမည့်သူ နောက်တစ်ယောက်ကို ရှာပါ။

4. What is the size of the fingerlings you put/stocked?

- a. 3"-5"
- b. > 5" → Mark as Non-doer and continue to Section B
- c. < 3" → Mark as Non-doer and continue to Section B
- d. Do not know/ Can't remember → End interview and find another respondent

Doer (all of the following)	Non Doer (any one of the following)	Do not interview (any one of the following)
Question 1 – A, B		Question 1 – C
Question 2 – A, B		Question 2 – C
Question 3 – A	Question 3 – B, C	Question 3 – D
Question 4 – A	Question 4 – B, C	Question 4 – D

GROUP: ☐ Doer ☐ Non-Doer

Behavior Explanation: အောက်ပါမေးခွန်းများသည် ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်း*ဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို မိမိ အိမ်ခြံဝန်းအတွင်းရှိ ငါးမွေးကန်တွင် ထည့်သွင်းမွေးမြူမည့်အကြောင်းကို ပြောသွားမည်ဖြစ်ပါသည်။ (*ကန်ချောင်စနစ်၊ ကြီးထွားနှုန်းကောင်းစေသောနှုန်း)

In the following questions I am going to be talking about stocking/putting your homestead ponds with 3,500-5,000 fingerlings in recommended size (3"-5") per acre each production cycle.

Section B –

(Perceived Self-efficacy)

1. အစ်ကို/အစ်မရဲ့ လက်ရှိ အသိပညာ၊ ဗဟုသုတတွေနဲ့ ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်တွင် ထည့်သွင်းမွေးမြူဖို့ အဆင်ပြေမယ်လို့ ထင်ပါသလား။

- a. ထင်တယ်
- b. မထင်ဘူး
- c. ပြေကောင်းပြေနိုင်မယ်။

1. With your current knowledge, skills and resources do you think you can put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

- a. Yes
- b. No
- c. Maybe

2a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူရတာ ဘာကြောင့် အဆင်ပြေတာလဲ။

2b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူခဲ့မယ်ဆိုရင် ဘာကြောင့် အဆင်ပြေမယ်ထင်လဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

2a. **Doers:** What makes it **easier** for you to put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

2b. **Non-doers:** What would make it **easier** for you put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?
(Write all responses below. Probe with "What else?")

(Perceived Self-efficacy)

3a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူဖို့ ဘယ်လိုအခက်အခဲတွေရှိသလဲ။

3b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူမယ်ဆိုရင် ဘယ်လိုအခက်အခဲတွေရှိမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

3a. **Doer:** What makes it **difficult** for you to put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

3b. **Non-Doer:** What would make it **difficult** for you to put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle? (Write all responses below. Probe with "What else?")

(Perceived Positive Consequences)

4a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူတဲ့အတွက် ဘယ်လို အကျိုးကျေးဇူးတွေရသလဲ။

4b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူမယ်ဆိုရင် ဘယ်လို အကျိုးကျေးဇူးတွေရမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

4a. **Doer:** What are the **advantages** of putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

4b. **Non-Doer:** What would be the **advantages** of putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle? (Write all responses below. Probe with "What else?")

(Perceived Negative Consequences)

5a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူတဲ့အတွက် ဘယ်လိုဆိုးကျိုးတွေရှိသလဲ။

5b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူမယ်ဆိုရင် ဘယ်လိုဆိုးကျိုးတွေရှိမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

5a. **Doer:** What are the **disadvantages** of putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

5b. **Non-Doer:** What would be the **disadvantages** of putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

(Write all responses below. Probe with "What else?")

(Perceived Social Norms)

6a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူတာကို ဘယ်သူတွေက အားပေးသလဲ။

6b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူမယ်ဆိုရင် ဘယ်သူတွေက အားပေးမယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

6a. **Doer:** Who are the people that **approve** of you putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

6b. **Non-Doer:** Who are the people that **would approve** of you putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

(Write all responses below. Probe with "What else?")

7a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူတာကို အားမပေးတာ ဘယ်သူတွေလဲ။

7b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၀၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူမယ်ဆိုရင် အားမပေးတာ ဘယ်သူတွေဖြစ်မယ်ထင်သလဲ။

(အဖြေအားလုံးကို အောက်တွင်ရေးပါ။ "တစ်ခြားဘာတွေရှိအုံးမလဲ။" ဟု ဆက်လက်မေးမြန်းစူးစမ်းပါ။)

7a. **Doer:** Who are the people that **disapprove** of you putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

7b. **Non-Doer:** Who are the people that **would disapprove** of you putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

(Write all responses below. Probe with "Who else?")

(Perceived Access)

8a. **Doers:** ငါးမွေးရာသီတိုင်းမှာ တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူဖို့ ငါးသားပေါက်တွေကို ရရှိဖို့ ဘယ်လောက်ခက်သလဲ။ အရမ်းခက်သလား၊

နည်းနည်းခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

8b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူဖို့ ငါးသားပေါက်တွေကို ရရှိဖို့ ဘယ်လောက်ခက်မယ်ထင်သလဲ။ အရမ်းခက်သလား၊

နည်းနည်း ခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

a. အရမ်းခက်တယ်။

- b. နည်းနည်းခက်တယ်။
- c. လုံးဝမခက်ပါဘူး။

8a. **Doer:** How difficult is it to get fingerlings at recommended quantity and size each production cycle? Would you say it is very difficult, somewhat difficult or not difficult at all?

8b. **Non-Doer:** How difficult would it be to get fingerlings at recommended quantity and size each production cycle? Would you say it is very difficult, somewhat difficult or not difficult at all?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Cues for Action / Reminders)

9a. **Doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုတ်ဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူဖို့အတွက် သတိရဖို့ ဘယ်လောက်ခက်သလဲ။ အရမ်းခက်သလား၊ နည်းနည်းခက်သလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

9b. **Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုတ်ဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို အစ်ကို/အစ်မရဲ့ ငါးမွေးကန်မှာ ထည့်သွင်းမွေးမြူဖို့ သတိရဖို့ ဘယ်လောက်ခက်မယ်ထင်သလဲ။ အရမ်းခက်မလား၊ နည်းနည်းခက်မလား သို့မဟုတ် လုံးဝမခက်ဘူးလား။

- a. အရမ်းခက်တယ်။
- b. နည်းနည်းခက်တယ်။
- c. လုံးဝမခက်ပါဘူး။

9a. **Doer:** How **difficult** is it to remember to put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle? Very difficult, somewhat difficult, or not difficult at all?

9b. **Non-Doer:** How **difficult** do you think it would be to remember to put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle? Very difficult, somewhat difficult, or not difficult at all?

- a. Very difficult
- b. Somewhat difficult
- c. Not difficult at all.

(Perceived Susceptibility/Perceived Risk)

10. **Doers and Non-doers:** မပြောကောင်း မဆိုကောင်း လာမယ့် ငါးဖော်မဲ့ရာသီမှာ အစ်မရဲ့ ငါးမွေးကန်မှ ဝင်ငွေနည်းနည်းရတာ၊ အမြတ်နည်းနည်းရတာ ဖြစ်နိုင်ခြေ ဘယ်လောက်ရှိမယ်ထင်သလဲ။ ဖြစ်နိုင်ခြေ အများကြီးရှိသလား။ ဖြစ်နိုင်ခြေ နည်းနည်းရှိသလား သို့မဟုတ် ဖြစ်နိုင်ခြေလုံးဝမရှိဘူးလား။

- a. ဖြစ်နိုင်ခြေအများကြီးရှိတယ်။
- b. ဖြစ်နိုင်ခြေနည်းနည်းရှိတယ်။
- c. ဖြစ်နိုင်ခြေလုံးဝမရှိပါ။



10. How likely is it that you will get low income/low profit from your homestead ponds this coming harvesting period? Very likely, somewhat likely, or not likely at all?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perceived Severity)

11. **Doers and Non-doers:** မပြောကောင်း မဆိုကောင်း တကယ်လို့ ငါးဖော်မဲ့ရာသီမှာ အစ်မရဲ့ ငါးမွေးကန်မှ ဝင်ငွေနည်းနည်းရရင်၊ အမြတ်နည်းနည်းရရင် ဘယ်လောက်ထိ ဆိုးမယ်ထင်သလဲ။

အရမ်းဆိုးနိုင်သလား၊ သိပ်မဆိုးလောက်ဘူးလား သို့မဟုတ် လုံးဝ မဆိုးလောက်ဘူးလား။

- a. အရမ်းဆိုးနိုင်တယ်။
- b. သိပ်မဆိုးလောက်ပါဘူး။
- c. လုံးဝ မဆိုးလောက်ပါဘူး။

11. How serious would it be if you got low income/low profit from your homestead ponds?

A very serious problem, somewhat serious problem, or not serious at all?

- a. Very serious problem
- b. Somewhat serious problem
- c. Not serious at all

(Action Efficacy)

12. **Doers and Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-

၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို မိမိ

အိမ်ခြံဝန်းအတွင်းရှိ ငါးမွေးကန်တွင် ထည့်သွင်းမွေးမြူရင် ငါးဖော်မဲ့ရာသီမှာ အစ်မရဲ့ အိမ်ခြံဝန်းအတွင်းရှိ

ငါးမွေးကန်မှ ဝင်ငွေနည်းနည်းရတာ၊ အမြတ်နည်းနည်းရတာ ဖြစ်နိုင်ခြေဘယ်လောက်ရှိမယ်ထင်သလဲ။

အရမ်းဖြစ်နိုင်ခြေရှိ လား။ ဖြစ်နိုင်ခြေသိပ်မရှိဘူးလား သို့မဟုတ် ဖြစ်နိုင်ခြေလုံးဝမရှိဘူးလား။

- a. ဖြစ်နိုင်ခြေအများကြီးရှိတယ်။
- b. ဖြစ်နိုင်ခြေသိပ်မရှိဘူး။
- c. ဖြစ်နိုင်ခြေလုံးဝမရှိပါ။

12. How likely is it that you will get low income/low profit if you did not put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle? Very likely, somewhat likely, not likely at all?

- a. Very likely
- b. Somewhat likely
- c. Not likely at all

(Perception of Divine Will)

13. **Doers and Non-doers:** အစ်မ ဝင်ငွေနည်းနည်းရတာ၊ အမြတ်နည်းနည်းရတာ အစ်မရဲ့

ကံတရားကြောင့် / ဘုရားသခင်ရဲ့အလိုတော်ကြောင့်လို့ ထင်သလား။

- a. ထင်တယ်။
- b. မထင်ပါဘူး။
- c. မသိပါ/မဖြေပါ။



13. Do you think it's Karma that causes you to get low income/ low profit?

- a. Yes
- b. No
- c. Don't know/Won't say

(Culture)

14. **Doers and Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို မိမိ အိမ်ခြံဝန်းအတွင်းရှိ ငါးမွေးကန်တွင် ထည့်သွင်းမွေးမြူတာကို ရှောင်ကြဉ်ခိုင်းတဲ့ ဓလေ့ထုံးစံ သို့မဟုတ် အယူအစွဲတွေ အစ်မတို့ရဲ့ ရပ်ရွာမှာ ရှိသလား။

- a. ရှိတယ်။
- b. မရှိဘူး။
- c. မသိပါ/မဖြေပါ။

14. Are there any cultural rules or taboos against putting/stocking your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

- a. Yes
- b. No
- c. Don't know/Won't say

(Policy)

15. **Doers and Non-doers:** ငါးမွေးရာသီတိုင်းတွင် တစ်ဧကလျှင် ငါးသားပေါက်ကောင်ရေ ၃၅၀၀-၅၀၀၀ နှုန်းဖြင့် အကြံပြုထားသည့်အရွယ်အစား (၃-၅) လက်မ ရှိ ငါးသားပေါက်ကို ငါးမွေးကန်တွင် ထည့်သွင်းမွေးမြူဖို့ ချမှတ်ထားတဲ့ ဥပဒေ (သို့) စည်းမျဉ်းစည်းကမ်းတွေ ရှိသလား။

- a. ရှိတယ်။
- b. မရှိဘူး။
- c. မသိပါ/မဖြေပါ။

15. Are there any community laws or rules in place that make it more likely that you put/stock your homestead ponds with 3,500-5,000 fingerlings per acre in recommended size (3"-5") each production cycle?

- a. Yes
- b. No
- c. Don't know/Won't say

(Universal Motivators)

16. **Doers and Non-doers:** အစ်ကို/အစ်မကို ငါးသားပေါက်ထည့်သွင်းမွေးမြူတာနဲ့မဆိုင်တဲ့ မေးခွန်း တစ်ခု မေးမယ်နော်။ အစ်ကို/အစ်မရဲ့ ဘဝမှာ အဖြစ်ချင်ဆုံးဆန္ဒတစ်ခုက ဘာလဲ။

16. Now I am going to ask you a question unrelated to stocking of fingerlings. What is your desire in life?

အခုလိုအချိန်ပေးတဲ့အတွက် ကျေးဇူးတင်ပါတယ်။
Thank the respondent for her/his time!

Annex 4. Training Schedule

Designing for Behavior Change Online Training (11–15 January 2021)

Time	Topics	Duration
Day one		
9:00-10:55 AM	Introduction to Behavior Change: Our Roles and the Process of Planned Change	1 hour 55 minutes
10:55- 11:55 AM	Overview of the DBC Framework	1 hour
1:00- 3:00 PM	Selecting and Defining the Feasible and Effective Behavior	2 hours
Day Two		
9:00-11:00 AM	The Priority and Influencing Groups (<i>includes break</i>)	2 hours
11:00-12:00 AM	Our DBC Frameworks Part 1: Describing the Behavior and Priority Group	1 hour
1:00- 3:00 PM	Identifying Determinants that Influence Behavior (<i>includes break</i>)	2 hours
Day three		
9:00-10:00 AM	The “Exercise” session	1 hour
10:00–12:00 AM	Formative Research to Find Key Determinants: Barrier Analysis and Doer/Non-Doer Studies (<i>continued after lunch</i>)	2 hours
1:00-3:00 PM	Preparation and Practicum: Conducting Formative Research (<i>includes break</i>)	2 hours
Day Four		
9:00-11:00 AM	Field Work	2 hours
11:00-12:00 AM	Compiling and Analyzing the Data	1 hour
1:00-3:00 PM	Writing the Bridges to Activities	2 hours
Day Five		
9:00-11:00 AM	Our DBC Frameworks Part 2: Identifying the Determinants and Bridges to Activities	2 hours
11:00-12:00 AM	Selecting Program Activities	1 hour
1:00-2:00 PM	Matching Messages to Determinants	1 hour

Barrier Analysis online training, field work and follow up workshop (5–14 July 2021)

Time	Topics	Duration
Day one		
9:00-10:00 AM	Overview of the DBC Framework	1 hour
10:00-11:00 AM	Review on determinants	1 hour
11:00-12:00	The “Exercise” Exercise Identifying determinants that Influence Behavior	1 hour
1:00-3:00 PM	The Barrier Analysis Study Introduction to the Questionnaire Step 1: Defining the Behavior for the Formative Research Step 2: Writing the Behavior Screening Questions	2 hours
3:00-5:00 PM	Step 3: Writing the Research Questions Learning to Interview the Doer/Non-Doer Way Step 4: Organizing the Field Work	2 hours
Day two		
9:00-10:00 AM	Practicing the questions and interview	1 hour
10:00 AM-2:00 PM	Pilot testing of the questions in the field	4 hours
2:00-5:00 PM	Feedback and revision of the questions	3 hours
4 days of Data collection (Step 5)		
Day 7-9		
9:00 AM-4:00 PM	Step 6: Coding, Tabulating, and Analyzing the Data Step 7: Using the Results to Make Decisions (Bridges to Activities and Behaviour Change Activities)	7 hours

Annex 5. Data collection team

Data collection- 07 to 12 July 2021

Khin U Township- BRAC Myanmar

Village	Distance from local market*	Name of Enumerators
Mayan Inn	2 miles	Ko Swan Ye Htet
Yone Su	0.25 mile	Ko Aung San Win, Ko Thein Than Aung,
Bying Kyaing	0.40 mile	Ma Nyein Nyein Aung, Ma Kay Thi Khaing and Ma Mi Mi Swe

*Due to COVID travel restrictions, the team couldn't go to further away villages

Supervisor- Ei Ei Phyo- WorldFish Myanmar

Co- Supervisor- Kyaw Win Khaing- WorldFish Myanmar

Salin Township- PACT Myanmar

Village	Distance from local market	Name of Enumerators
Tamar Chaung	6 miles	War War Nu, Phyo Ko Ko Aung, Tun Naing, Myo Myo Thant, Soe Soe Mu
Ah Nauk Kan Baung	2 miles	Kyaw Myo Win
Maung Hla Oo	2 miles	War War Nu, Phyo Ko Ko Aung, Tun Naing, Kyaw Myo Win, Soe Soe Mu
Ywar Thar Kone	30 miles	Phyo Ko Ko Aung, Soe Soe Mu
Maung Kaw Kan	18 miles	War War Nu, Kyaw Myo Win, Tun Naing, Myo Myo Thant
Kyoe Wan	22 miles	Phyo Ko Ko Aung, Tun Naing, Soe Soe Mu

Supervisor- Nang Tin May Win- WorldFish Myanmar

Co- Supervisor- Aung Myo Lwin- WorldFish Myanmar

Taunggyi Township- BRAC Myanmar

Village	Distance from local market	Name of Enumerators
Naung Boke	Nant Khone Market- 6 Miles	Myint Myint Zaw, Ko Ko Aung, Nan Hmwe Nge, Aung Khin Moe, Nan Wai May Kyi
Palilin	Taunggyi Market- 3 Miles	Myint Myint Zaw, Ko Ko Aung, Nan Hmwe Nge, Aung Khin Moe, Nan Wai May Kyi
ThinBaw	Taunggyi Market- 9 Miles	Ko Ko Aung, Nan Hmwe Nge, Aung Khin Moe, Nan Wai May Kyi
Sa Khae	Za Lae Market- 3 Miles	Ko Ko Aung, Aung Khin Moe, Myint Myint Zaw
Myay Ni Kone	Aung Tha Pyay Market- 6 Miles	Myint Myint Zaw, Ko Ko Aung, Nan Hmwe Nge, Aung Khin Moe, Nan Wai May Kyi
Kone Nyunt	Aung Tha Pyay Market- 6 Miles	Nan Wai May Kyi, Myint Myint Zaw, Nan Hmwe Nge, Aung Khin Moe
Ma Gyi Pin	Aye Tharyar Market- 4 Miles	Nan Wai May Kyi, Myint Myint Zaw

Supervisor- Christine Wai- WorldFish Myanmar

Co- Supervisor- Kyaw Moe Oo- WorldFish Myanmar

Main Supervisors:

1. **Quennie Vi Rizaldo-** WorldFish Myanmar
2. **Dr. Saw Eden-** Save the Children

Annex 6. Behavior 1: Significant Determinants in Khin U Township

Barriers	Enablers
Perceived Self-efficacy They lack time and they do not have enough money or job to buy variety foods.	Perceived Self-efficacy They like consuming variety of foods because it is delicious
Perceived Negative Consequence - It makes them feel dizzy and causes vomiting, food poisoning, sickness especially when foods are not appropriate for them. - It cost money (additional expense) to buy food - It is time consuming to buy and prepare food	Perceived Positive Consequence It makes them feel strong and energetic.
Perceived Social Norms Sister	
Perceived Action Efficacy	
Perceived Divine Will	

Annex 7. Behavior 2: Significant Determinants in Salin and Taunggyi Townships

Barriers	Enablers
Perceived Self-efficacy	Perceived Self-efficacy
<u>Salin</u> - It requires additional money to purchase the recommended size of fish fingerlings and it needs more fish feeds which can be costly - Worried that fish will be stolen and poisoned because the pond is far from the house. It is time consuming to manage the pond e.g. feed the fish.	<u>Salin</u> SSA farmer have an experience that fish has high survival rate and fish are not going to disappear.
<u>Taunggyi</u> Fear that fish will be eaten by snakes, birds and predatory fish	<u>Taunggyi</u> - SSA farmer have knowledge that fish needs good enough space for it to grow - SSA farmer experienced that few fish disappeared and died. It is easy to manage the pond. - SSA farmer experienced that predatory fish, snakes and birds will not eat fish fingerlings - SSA farmer have knowledge that because the pond is rich with natural fertilizer, fish will grow well.
Perceived Negative Consequence	Perceived Positive Consequence
<u>Salin</u> - Worried that fish will be lost due to heavy rain and flood. - The area has less access to water which result to drying up of ponds earlier even if it is not yet harvest time. - Stocking of many fish can cause slow growth rate	<u>Salin</u> Feel healthy because we can eat fish
<u>Taunggyi</u> - It is more costly as the fish fingerling is big and it needs more fish feed. Also, it is difficult to buy fish fingerling at the right size and transporting it is challenging. - Worried that fish will be lost due to predatory fish, snake, frog, and birds.	<u>Taunggyi</u> - I can get income and profit that can help me purchase food for the family. - Good access to fish for consumption because they can harvest it from the pond. Also, we can make dried fish and consume it which can save money. - The fish growth is faster due to good space of the pond which means I can sell at the right time. - It can reduce cost for fish feeds due to availability of natural fertilizer in the pond. - I can give present to others
Perceived Social Norms	Perceived Social Norms
<u>Salin</u> Grandfather	<u>Taunggyi</u> <u>Mother</u>

Perceived somewhat difficult to access

Salin

- Very difficult

Perceived cues for action

Salin and Taunggyi

- Somewhat difficult to remember the behavior

Perceived cues for action

Salin

- Not difficult to remember the behavior

Perceived Action Efficacy

Salin

- Somewhat likely

Perceived Divine Will

Taunggyi

Perceived Divine Will

Taunggyi

Universal Motivators

Salin

- Want to have happy, healthy and peaceful family
- Want to be rich

Taunggyi

- have a regular income, job, successful in bussiness, agriculture

