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# Nutrition approaches in the Fish for Livelihoods project



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# NUTRITION APPROACHES IN THE FISH FOR LIVELIHOODS PROJECT

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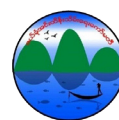
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## About Fish for Livelihoods

Capture fisheries are declining in Myanmar, yet 60% of their animal sourced food is fish. To meet the growing demand for fish, aquaculture production 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. The United States Agency for International Development (USAID) funded Fish for Livelihoods project aims to increase fish production, labor productivity, food availability and fish consumption especially for women and children from vulnerable households. It will provide opportunities for entrepreneurial activities in small-scale aquaculture systems, and promote social behavioral change messages that direct home production and market purchases toward nutrition conscious household decisions.

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# Table of contents

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Introduction	1
Purpose of this document	2
Modalities	3
Key interventions	6
1. Training of Trainers on nutrition, effective WASH practices, food safety and quality control	6
2. Training on basic nutrition, effective WASH practices, food safety and quality control among project participants	6
3. Social behavior change communication activities focusing on increased fish consumption and improved dietary diversity, especially among women of reproductive age and young children	6
4. Providing small indigenous fish species broodstock, vegetable and fruit seeds and water, sanitation and hygiene hardware among project participants	7
5. Food safety analysis and nutrient analysis	7
6. Developing fish powder for young children	8
7. Strengthening engagement with nutrition stakeholders	8
Notes	9
References	10

# Introduction

Fish for Livelihoods is funded by the United States Agency for International Development (USAID). The project, which runs from 2019 to 2024, is implemented by WorldFish in partnership with the Department of Fisheries, Myanmar Fisheries Federation, BRAC, Karuna Mission Social Solidarity, Pekhon lake committee, International Water Management Institute (IWMI) and PACT.

The project focuses on target populations in Magway, Mandalay, Sagaing, Kachin and Southern and Eastern Shan. The goal is to provide inclusive and sustainable small-scale aquaculture growth to increase income, reduce poverty and improve dietary diversity, especially among women of reproductive age and young children.

The project has three specific objectives:

1. To increase small-scale aquaculture production through improved land and water use, access to high quality inputs (feed, seed and equipment), capacity development, research into production systems and access to credit.
2. To develop and use market-based system approaches to increase access to domestic markets and ensure the consistent supply of safe fish and fish products.
3. To deliver enhanced nutrition and effective water, sanitation and hygiene (WASH) practices through social behavior change communication (SBCC) activities and to develop capacities in the production and processing of food-safe aquaculture and other fish-based products.

The project interventions address the underlying causes of malnutrition in Myanmar: household food and nutrition insecurity, inadequate care and an unhealthy environment (UNICEF 2013). Undernutrition and micronutrient deficiencies affect children under 5 years old and women of reproductive age (MOHS 2018), with long-term consequences for productivity and economic development.

The project is aligned to the country's commitment to combating malnutrition as reflected in the government's Multi-Sectoral National Plan of Action for Nutrition (MS-NPAN).<sup>1</sup> The MS-NPAN reinforces the need for all actors from relevant ministries, nongovernmental organizations (NGOs) and the private sector to work together, as well as with the Myanmar Agricultural Development Strategy (ADS),<sup>2</sup> to find solutions.



Women involved in postharvest activities in a fish farm in Madaya, Mandalay.

## Purpose of this document

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This document provides a common understanding among stakeholders (staff from implementing partners, WorldFish staff, donors, communities) on the approaches undertaken throughout the project. These approaches are based on experience from other WorldFish projects, both in Myanmar and in neighboring countries. This document serves only as a guide, so feedback and recommendations from stakeholders are welcome. They are also encouraged to have open communication with the project team on what works and what does not in order to ensure that the approaches are widely applicable, inclusive and meaningful for the target communities.



Photo credit: Quennie Riza/WorldFish

A woman small-scale aquaculture farmer showing the record book in Pyapon, Delta, Myanmar.

# Modalities

The project engages implementing partners to work in the project intervention areas. Through community facilitators, the implementing partners directly implement the key interventions, with technical support from WorldFish Myanmar (Table 1).

Key interventions	Methods and description (how?)	Target audience	By whom (gendered approach)	Duration/frequency
<p>Training of Trainers on nutrition, effective WASH practices, food safety and quality control</p> <p>(combined in small-scale aquaculture training)</p>	<p>The training focuses on the importance of dietary diversity, consuming fish (and other animal-source foods) including small indigenous species (SIS) (with the head on) and adopting effective WASH practices. It ensures that these result in improved nutrition, especially for women of reproductive age and children under 5 years old.</p> <p>It is critical that the project emphasizes both increased aquaculture production and enhanced adoption of good nutrition and WASH practices to provide a balanced and holistic message.</p> <p>Participants are expected to demonstrate what they learned per topic using different methods of facilitation.</p>	<p>Community facilitators from implementing partners</p>	<p>WorldFish team</p> <p>Department of Fisheries expert (or a consultant) on postharvest and food safety and quality control</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• What is the literacy level of the participants?</li> <li>• Are the participants able to understand English or Burmese?</li> </ul>	<p>Seven days, combined with small-scale aquaculture (SSA) but excluding postharvest and food safety and quality control</p> <p>Nutrition training will take 3 days</p> <p>Postharvest training will last 3 days</p>
<p>Training on basic nutrition and effective WASH practices, food safety and quality control</p>	<p>Once selected to be part of the project, participants receive module training on the following:</p> <ul style="list-style-type: none"> <li>• SSA technology</li> <li>• nutrition, such as infant and young child feeding, causes of malnutrition, food groups</li> <li>• vegetable and fruit production</li> <li>• effective WASH practices</li> <li>• postharvest and food safety and quality control.</li> </ul> <p>Each module session needs to be assessed for whether it is appropriate to the target audience. For instance, the SSA module may not be applicable to internally displaced persons (IDP) and fish vendors/processors; however, they are given an opportunity to join when they want to.</p> <p>Multiple stakeholders are consulted to ensure applicability, including consumers, fish vendors/processors, staff from implementing partners, private business and the Myanmar Fisheries Federation. This is done when engaging fish vendors/processors in activities to improve the quality of fish sold in the market as well as food safety practices. (Refer to recommended activities indicated in the Market Systems Intervention Design workshop.)</p>	<ul style="list-style-type: none"> <li>• SSA farmers</li> <li>• IDPs</li> <li>• fishers</li> <li>• fish vendors/processors</li> </ul>	<p>Staff from implementing partners</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• What is a convenient schedule for the participants?</li> <li>• Are women/men able to discuss and engage freely when trained together?</li> <li>• Is it appropriate that SSA farmers, fish vendors and IDPs are grouped together in the sessions?</li> <li>• What is the literacy level of the participants?</li> <li>• Is the venue a safe/neutral space for IDPs, women/men, fish vendors/processors, different religions and ethnic groups?</li> </ul>	<p>Each module is covered for 1 day.</p> <p>Postharvest and food safety and quality control usually lasts for 3 days, though it can be a separate training schedule.</p>

Key interventions	Methods and description (how?)	Target audience	By whom (gendered approach)	Duration/frequency
<p>SBCC activities focusing on fish consumption, dietary diversity, adopting effective WASH practices</p>	<p>The significant barriers and enablers of adopting practices by the priority group are identified based on the barrier analysis study. The key interventions are developed by staff from implementing partners and the WorldFish team.</p> <p>Possible behaviors to study include the following:</p> <ul style="list-style-type: none"> <li>• consumption of SIS (with head on) among children under 5 years old</li> <li>• consumption of diverse food among pregnant and lactating women (PLW)</li> <li>• consumption of fresh and good quality fish</li> <li>• PLW or children under 5 years old washing their hands at five critical times</li> <li>• PLW or children under 5 using improved latrines</li> <li>• consumption of dried fish powder.</li> </ul> <p>Activities:</p> <ul style="list-style-type: none"> <li>• identifying mothers, fathers, peer group, grandparents group</li> <li>• monthly consultation among the priority group on the barriers faced in adopting behaviors</li> <li>• awareness raising activities at the village, region, state and national level: school days, village development committee meetings, health clinic (immunization days, PLW consultation, and the nutrition month campaign in August)</li> <li>• using a mobile application platform to share the importance of fish, vegetables and diversity of food in the diets</li> <li>• creative activities, such as role playing, practical demonstrations, counseling, Q&amp;As, home visits together with promoters.</li> </ul>	<p>Priority group, promoters</p> <p>Community women/men</p> <p>Project participants</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Develop materials focusing on messages that can adopt change of behavior “triggers.”</li> <li>• Private company/consultant can help develop catchy videos, infomercials and posters that can challenge old behaviors.</li> <li>• Develop behavior change communication strategy.</li> </ul>	<p>IP staff</p> <p>WorldFish staff</p> <p>Private company/consultant</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• What is a convenient schedule for the participants?</li> <li>• Are different community members able to participate together?</li> <li>• What is the literacy level of the participants?</li> <li>• Is the venue a safe/neutral space for IDPs, women/men, fish vendors/processors, different religions and ethnic groups?</li> <li>• Are the materials used easy to understand by many? If not, how can we improve it? Ask suggestions from participants.</li> </ul>	<p>Once a month</p>
<p>Providing SIS broodstock, vegetable and fruit seeds, and WASH hardware</p>	<p>When consumed whole, small indigenous fish species, such as mola (<i>nga bel phyu</i>), darkina (<i>nga daun zin</i>) and pool barb (<i>nga kor mar</i>), are rich in essential micronutrients and animal protein.</p> <p>Together with large fish species, SIS are stocked in homestead ponds. Large fish take 6–7 months to grow to a marketable size, but SIS are partially harvested at least once or twice a week, making it a significant animal-source food for family consumption.</p> <p>Using current experience from other WorldFish projects in Myanmar, SIS are caught from the wild and introduced into homestead ponds. SIS contribute to the overall production and nutritional quality of the pond system and do not hamper the growth of large fish species.</p> <p>Planting on pond embankments and in homestead gardens increases dietary diversity among household members. Seasonal calendars are an informative guide to determine which vegetables and fruits are grown, or have the potential to grow, in the area.</p> <p>After developing criteria for beneficiaries and a careful assessment, WASH hardware is distributed to project participants, including (1) tippy taps, a simple handwashing technology made from a local container with holes that is situated near latrine, (2) clay water filters for safe drinking water and (3) improved latrines.</p>	<p>SSA farmers, farmers with community ponds</p> <p>IDPs and other vulnerable groups who have access to nearby ponds</p>	<p>Staff from implementing partners</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>• Are landless households being included?</li> <li>• Are households with children under 5 years old being prioritized?</li> <li>• Are there barriers to using the technology? How are these barriers being addressed?</li> <li>• Are the feedback/comments from project participants taken into consideration after providing the intervention?</li> </ul>	<p>Once per cycle for SIS per planting season</p>



Key interventions	Methods and description (how?)	Target audience	By whom (gendered approach)	Duration/frequency
Food safety analysis/ nutrient analysis	<p>Region/State sampling of commonly consumed fish- based products for nutrient analysis and food safety risks.</p> <ul style="list-style-type: none"> <li>Describe the ingredients and method of post-harvest fish products</li> <li>Identify critical points of contamination and food safety risks</li> <li>Laboratory analysis of samples</li> <li>Disseminate the findings through scientific literature and program brief.</li> </ul>	<p>All stakeholders, including government, UN organizations, the private sector, SUN, NGOs, community-based organizations and donors.</p> <p>Actors in the post-harvest value chain</p> <p>Local consumers</p>	WorldFish staff	<p>Once of sampling</p> <p>Ongoing dissemination of evidence base.</p>
Developing dried fish powder	<p>Dried fish powder development is approached in two ways:</p> <ol style="list-style-type: none"> <li>By engaging project participants, especially those with children under 5 years old, to use simple technologies, such as local grinders, to make dried SIS into powder. The powder is used as a complementary food for infants over 6 months old. The surplus produced at home can be sold for additional income.</li> <li>By partnering with a local business that shares the goal of WorldFish in developing nutritious, safe and good quality products that benefit local consumers.</li> </ol>	<p>Project participants with children under 5 years old</p> <p>IDPs with children under 5 years old</p> <p>Local consumers</p>	<p>Staff from implementing partners</p> <p>WorldFish staff</p>	Year-round
Strengthening engagement with nutrition stakeholders	<p>Participating in nutrition platforms at the regional/state level and the national level includes the following: Scaling Up Nutrition Civil Society Alliance (SUN CSA), Technical Working Group meetings, and National Nutrition Month celebrations led by the Ministry of Health and Sports.</p>	<p>All stakeholders, including government, UN organizations, the private sector, NGOs, community-based organizations and donors</p>	<p>Staff from implementing partners and WorldFish field coordinators at the sub-national level of MS-NPAN and meetings of the Food Security Working Group (FSWG)</p> <p>WorldFish staff (national level)</p>	<p>Scheduled meetings of sub-national MS-NPAN, national level MS-NPAN, FSWG and TWG.</p>

**Table 1.** Brief guide of key interventions in Fish for Livelihoods project.

# Key interventions

## 1. Training of Trainers on nutrition, effective WASH practices, food safety and quality control

The activity imparts knowledge and information about nutrition among the community facilitators who serve as front-line field staff for the project. The majority of the community facilitators may have limited knowledge on basic nutrition and effective WASH practices, so the training improves knowledge to deliver messages efficiently when conducting module training among project participants and nutrition awareness raising activities at the community level.

The training usually lasts 3–4 days. The main topics covered include the following:

- basic food groups
- types of micronutrients
- the importance of a balanced diet
- intergenerational dynamics of malnutrition
- causes of malnutrition
- breastfeeding and complementary feeding,
- the nutritional value of fish
- cooking demonstrations with an emphasis on SIS
- the importance of drinking safe water, proper handwashing, and keeping food, containers and the environment clean.

The training topics are based on the learning sessions developed by the Save the Children Myanmar LEARN project and are aligned with the guidelines provided by the National Nutrition Centre under the Ministry of Health and Sports. The material developed by SPRING<sup>3</sup> on essential nutrition actions and essential hygiene actions is also used as a reference.

## 2. Training on basic nutrition, effective WASH practices, food safety and quality control among project participants

The training provides knowledge and basic information on nutrition. It focuses on the importance of eating fish and vegetables and the importance of a diverse diet to achieve good nutrition among project participants. Studies

in multiple countries have demonstrated a complementary approach of providing farm inputs (seeds, farm tools) and that nutrition knowledge increases positive nutrition outcomes among households (Schreinemachers et al. 2016; de Brauw et al. 2015).

While women in Myanmar maintain traditional roles performing domestic duties, the project encourages engaging men, especially husbands, in nutrition activities. Evidence shows that involving them increases their knowledge, enhances their support for women and improves joint decision-making, which results in improved nutrition among women and children (Nguyen et al. 2018; Tokhi et al. 2018).

## 3. Social behavior change communication activities focusing on increased fish consumption and improved dietary diversity, especially among women of reproductive age and young children

SBCC is the “strategic use of communication approaches to promote changes in knowledge, attitudes, norms, beliefs and behaviors” (Health Communication Capacity Collaborative 2016). Evidence from other countries shows improved nutritional status after rolling out interventions on homestead food production coupled with SBCC activities among project participants (Olney et al. 2015). These activities have spillover effects among neighbors by improving nutrition knowledge and adopting positive nutrition behaviors (Hoddinot et al. 2017).

After identifying behaviors to study, through consultation with stakeholders, the project conducts a barrier analysis study that aims to identify barriers and enablers of the priority group. Based on the designing for behavior change (DBC) framework,<sup>4</sup> it identifies bridges of activities and key project activities that can support developing a behavior change communication strategy to increase the adoption of desired behaviors among the priority group.

In addition, as mobile phones have become increasingly popular in Myanmar, the project is using a phone application and social media platforms to communicate key messages among non-project participants. This helps to reach individuals beyond project intervention areas.

#### **4. Providing small indigenous fish species broodstock, vegetable and fruit seeds and water, sanitation and hygiene hardware among project participants**

A recent diet modeling analysis in Myanmar demonstrated that having large fish species in homestead ponds can help reduce the cost of a nutritious diet by 20% (WFP 2019). However, data in other WorldFish projects showed that the majority of farmers sell large fish at marketable size and rarely consume them. This means that large fish do not contribute to the nutrient needs of family members. To address this, the project introduced SIS in ponds to ensure that fish are accessible and available for consumption, during different seasons, among family members to contribute to improved nutrition. SIS are micronutrient-rich, especially when eaten whole with the head, bones and viscera. They are also rich in essential nutrients, such as vitamin A, vitamin B12, iron, calcium, zinc and essential fatty acids, which are important for growth and development in young children (Thilsted 2012; Bogard et al. 2015).

A nutritious diet, however, must include foods other than fish. To increase dietary diversity, the project introduced planting colored vegetables (e.g. moringa and pumpkin) and fruits (e.g. papaya) that are easy to grow on pond embankments and in homestead gardens. For small homesteads, using pond embankments increases the area for vegetable and fruit production. In addition, water from the pond can be used for the plants, while the sludge from ponds (after harvesting and cleaning the pond) can be used as a natural fertilizer.

The project integrates WASH activities as one of the nutrition interventions. This is based on results from studies that link diarrheal deaths and stunting to inadequate drinking water, poor sanitation and hand hygiene practices among young children (Pruss-Ustun et al. 2014; Humphrey 2009). These activities will be rolled out after consultations with

organizations implementing WASH projects in the country and with careful evaluation from staff of implementing partners and the project team. WASH hardware, such as water containers for handwashing or tippy taps, clay water filters and latrines, are provided for project participants, while a set of criteria will be developed for prioritization.

#### **5. Food safety analysis and nutrient analysis**

Fish and aquatic animals in fresh and processed form make up the largest share of animal sourced foods in the Myanmar diet. Processed fish and aquatic animal products, such as dried and fermented fish, are estimated to contribute to a third of total fish consumption (Youn et al. 2018). Understanding the unique contribution of micronutrients from this important food source is comprised by an absence of primary nutrient composition data. Commonly consumed fish-based products in Myanmar have been identified through national consumption surveys, and scoping local markets in the Fish for Livelihoods project townships. The project will fill this knowledge gap by sampling commonly consumed fish-based products for laboratory analysis of macro and micronutrients.

Reducing the risk of foodborne illness and neglected tropical diseases is an important component for improving nutrition and health in Myanmar. Critical points of contamination and food safety risk along the fish value chain have been observed through the Department of Fisheries and WorldFish projects. The fish product samples will also be sent for analysis of microbes, parasites and contaminants, which can pose a risk to human health.

This research will fill knowledge gaps and can be applied through the following:

- Provide primary nutrient composition data for Myanmar food composition tables.
- Nutrient data that represents locally consumed foods can be used in modeling dietary recommendations, such as a national healthy plate and food based dietary guidelines.
- The National Nutrition Centre has highlighted the need to update Myanmar's food composition tables and food based dietary guidelines.
- Inform nutrition practitioners in fish related dietary recommendations and program designers on developing nutrition-sensitive fish agri-food system activities.

- Identify specific food safety and contamination risks to inform targeted solutions.

This research will be further applied as evidence-based activities designed for the Fish for Livelihoods project. This includes training vendors and processors in improved food hygiene practices for fresh and processed fish, as well as working with postharvest producers on nutrient dense culturally appropriate fish-based products, such as dried or pickled small fish. These products could simultaneously reduce postharvest loss compared to fresh fish and increase the availability of a preserved product that can be available for vulnerable groups especially in fish deficit areas.

## 6. Developing fish powder for young children

Based on the results from the barrier analysis study conducted in one of WorldFish's project areas, the main barrier to feeding fish to young children by caregivers is the fear of choking on the fish bones (Rizaldo and Weatherson 2018). To address this, the project will take two approaches:

1. At the community level, by training a group of women and men to make fish powder by using a local grinder with dried SIS as the main ingredient (dried vegetable leaves may also be added)
2. At the commercial level, by engaging a private company to assist in developing a fish powder. This will be done on a pilot basis until it is

ready to be scaled out, making it available widely for local consumers.

Fish powder is a nutrient-rich food with multiple essential nutrients. The powder can be added to soft rice (or porridge) and vegetables, such as mashed pumpkin and orange sweet potato, to make a delicious and nutrient-rich complementary food for young children.

## 7. Strengthening engagement with nutrition stakeholders

The aim is to increase visibility and reinforce the value of fish in improving nutrition, as well as to provide information among stakeholders on the nutrition-sensitive fish agri-food systems approaches implemented by WorldFish. Moreover, by participating in nutrition and health discussions (such as the SUN Civil Society Alliance, and the Technical Working Group), fish will be put on the agenda at the policy level, benefiting many rural communities that are heavily reliant on fish as the primary animal-source food in their diets (Youn et al. 2018).



A man and a woman together selling fish in the Kale market, Sagaing region.

# Notes

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- <sup>1</sup> Ministry of Health and Sports. 2018. Multi-Sectoral National Plan of Action for Nutrition (MS-NPAN) 2019–2023, MOHS, MOALI, MSWRRD & MOE.
- <sup>2</sup> Ministry of Agriculture, Livestock and Irrigation. 2018. Myanmar Agricultural Development Strategy and Investment Plan 2019–2023.
- <sup>3</sup> SPRING. 2014. Essential nutrition actions and essential hygiene actions: A training guide for Peace Corps health volunteers and Peace Corps staff. The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project. Arlington, VA.
- <sup>4</sup> The DBC framework presents key elements (behavior, priority group or influencing groups, determinants, bridges to activities, and activities) that help in developing and reviewing a behavior change strategy.

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