

Planning a nutrition-sensitive approach to aquatic agricultural systems research in Solomon Islands



PLANNING A NUTRITION-SENSITIVE APPROACH TO AQUATIC AGRICULTURAL SYSTEMS RESEARCH IN SOLOMON ISLANDS

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INTRODUCTION

Aquatic agricultural systems are places where fishing and farming in freshwater and/or coastal systems contribute significantly to household nutrition, food security and income (AAS 2012). In Solomon Islands, where aquatic agricultural systems form the foundation of the rural economy, 80% of the population are rural, subsistence-oriented, smallholder farmers and fishers. Coastal marine resources provide the primary animal-source foods, while root crops, fruits and vegetables are produced in household gardens (Andersen et al. 2013).

Communities dependent on these aquatic agricultural systems face major challenges from rising population and declining quality and availability of marine and land resources. Fish are increasingly difficult to catch and expensive to purchase as the gap between production and demand for coastal marine resources continues to widen (Bell et al. 2009). Garden production has been negatively affected by the intensification of cropping required to fulfill the needs of a greater number of inhabitants, which has led to reduced fallow periods, soil degradation, increased pests and disease, and declining crop yields.

WorldFish, through the CGIAR Research Program on Aquatic Agricultural Systems (AAS) has engaged in research in development in Solomon Islands to address the challenges faced in these systems, with the goal of improving the well-being of the people who depend upon them. Within Solomon Islands, the program has been implemented in two AAS hubs: Malaita hub in Malaita Province and Western hub in Western Province. Research addresses issues that have been identified in each of the hubs through joint development of a hub development challenge by local communities, civil society and government agencies, and researchers—the hub stakeholders. The hub development challenge provides the vision for the stakeholders to work towards collectively.

In Malaita hub, the development challenge, as defined by stakeholders, is “to improve the lives of people dependent on aquatic agricultural systems through more productive, diversified livelihoods that empower communities to be able to adapt to change and make more effective use of their resources.” To help achieve the Malaita hub development challenge, research in the farming sector is focused on improving dietary diversity and income for smallholder farmers through improved fish and agricultural farming technologies using a nutrition-sensitive approach.

This brief describes the background to, the rationale for and the initial steps towards implementing a nutrition-sensitive approach to agricultural and fisheries research in development in the Solomon Islands context.

WHY NUTRITION RESEARCH?

A recent review of the state of food and nutrition security in Solomon Islands highlighted that Solomon Islands suffers the double burden of malnutrition: the combination of both stunted children and overweight adults (Andersen et al. 2013). National data (collected in 2006–2007) found that 32.8% of children under 5 years of age suffer from stunted growth, with higher rates among children under 2 years, particularly those in rural areas (Solomon Islands National Statistics Office et al. 2009). Stunted growth reflects the failure to reach linear growth potential, in part as a result of long-term deficiency of nutrients, energy or both. In Solomon Islands, it is suggested that the prevalence of stunting is attributable to long-term diets that are inadequate in vitamins and minerals and/or frequent exposure to infections (Andersen et al. 2013).

The prevalence of adult overweight and obesity was also shown to be high, with 44.1% of women (aged 15–49) overweight or obese; similarly, 30.5% of men (aged 15–49) were overweight or obese (Solomon Islands National Statistics Office et al. 2009). Overweight and obesity are associated with higher risk of noncommunicable diseases such as diabetes, cardiovascular diseases, cancers and chronic respiratory diseases. In Solomon Islands, rates of diabetes, along with other noncommunicable diseases, are among the highest in the world, with 17% of adults aged 30–70 years diagnosed with the disease (WHO 2014). Anemia (often linked to iron deficiency) is also an issue that affects nearly half of all children under 5 years of age, as well as 44% of women aged 15–49 years (Solomon Islands National Statistics Office et al. 2009).

Fisheries and agriculture contribute directly to the nutrition of Solomon Islanders through household food consumption, and indirectly through income generation, livelihoods and food systems. By working with people reliant upon aquatic agricultural systems, there is scope to contribute to improved nutrition. The vision for aquatic agricultural farming systems in Malaita hub, as articulated in the theory of change developed by farmers, government

officials and nongovernmental organization (NGO) representatives in the fisheries and agricultural sectors in 2014, is the following:

“Men and women farmers have adopted safer (for the environment and human health) and sustainable farming practices. These practices will produce a variety of climate-change-resilient, good-quality, nutritious foods, for both consumption and market. This will result in families consuming more diverse, nutrient-rich local foods that are prepared through improved traditional and new efficient ways of cooking that retain nutritional value. Support organizations with activities in the hub are closely linked and are committed to sharing knowledge and learning, to be able to support farmers and transfer and implement innovations. As a result, nutrition of men, women and children has improved, and farming systems are more productive, enabling families to produce sufficient goods for consumption and increase their income.”

WHAT IS A NUTRITION-SENSITIVE APPROACH?

Nutrition is considered both an essential *input to* and *outcome of* sustainable development. People need good nutrition in order to learn, lead productive lives, and contribute to broader social and economic development. At the same time, development of institutions, resources and health services is required to achieve population-wide improvements in nutrition.

A person's nutritional status is determined by a series of immediate, underlying and basic elements as depicted in the widely cited United Nations Children's Fund (UNICEF) framework of malnutrition (Figure 1). Nutrition-specific approaches are those that aim to address the immediate causes of malnutrition through improvements in nutrient intake (e.g. vitamin A supplementation) and/or health status (e.g.

child immunization). Although nutrition-specific approaches play an essential role, it is now recognized that on their own they are inadequate to achieve the necessary global reductions in malnutrition (Bhutta et al. 2013). Protection of natural resources, equitable economic growth, women's empowerment, and development of sustainable and resilient food systems are also essential if improved nutrition and health are to be achieved. Nutrition-sensitive approaches are those that address these basic determinants (the enabling environment) of malnutrition, as well as the underlying determinants, including food security, social safety nets, gender empowerment, and sanitation and hygiene programs (Figure 1).

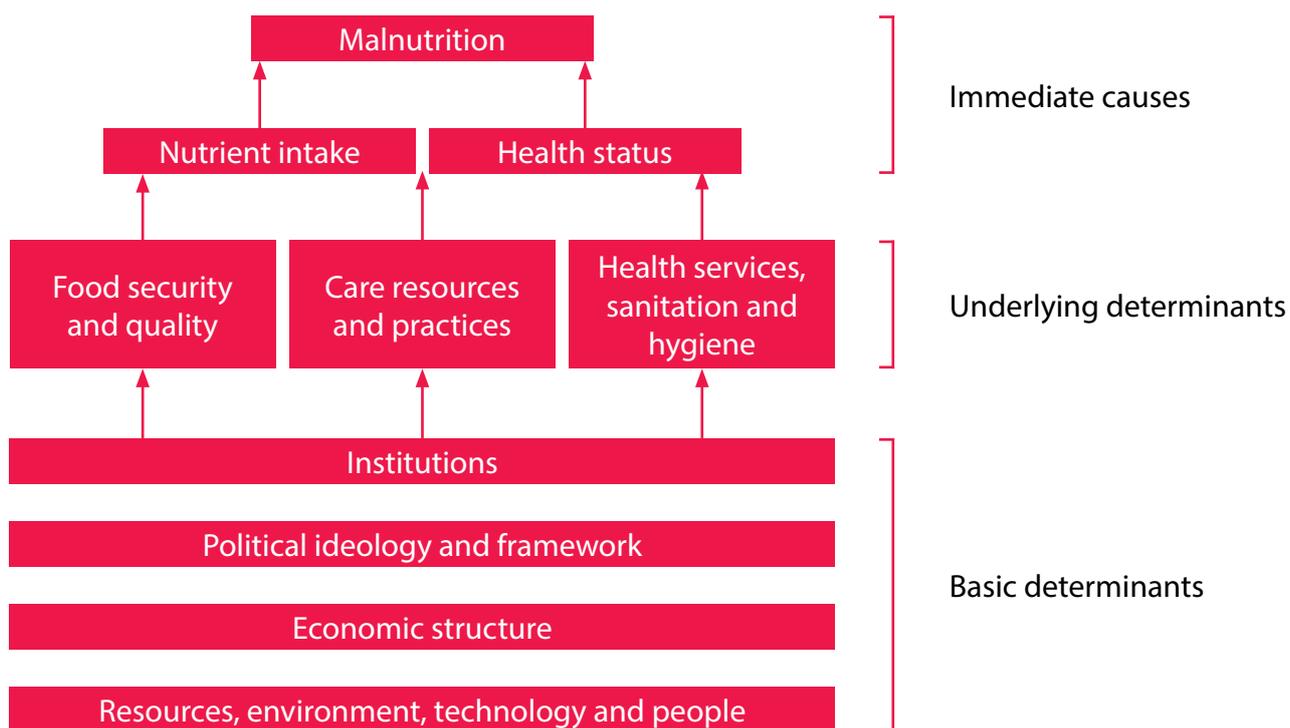


Figure 1. The UNICEF causal framework for nutrition. Source: Herforth and Harris (2014), originally adapted from UNICEF (1990).

Nutrition-sensitive approaches to agriculture and rural development have received increasing attention from development organizations over the past decade, resulting in a plethora of guidance documents seeking to enable agriculture and rural development programs to achieve nutrition impact. Recently, the Food and Agriculture Organization of the United Nations (FAO) has synthesized a set of 20

guiding principles (including planning, doing and supporting principles; see Box 1) from relevant institutional documents (FAO 2013). While it is recognized that not all principles may be achievable within a program, the planning principles outlined by FAO have been used to guide the development of the nutrition-sensitive approach for aquatic agricultural systems research in Solomon Islands.

Box 1. Guiding principles for maximizing nutrition impact (FAO 2013)

Planning principles

1. Incorporate explicit nutrition objectives.
2. Assess the context to identify nutritional problems and groups most at risk.
3. Do no harm—avoid unintended negative consequences.
4. Measure impact through program monitoring and evaluation.
5. Maximize opportunities through multisector coordination.
6. Maximize the impact of household income on nutrition.
7. Increase equitable access to productive resources through policies and programs.
8. Target the most vulnerable groups, including smallholder farmers, women, and resource-poor or food-insecure households.

Doing principles

9. Empower women, the primary caretakers in households.
10. Incorporate nutrition education to improve consumption and nutrition effects of interventions.
11. Manage natural resources.
12. Diversify production and livelihoods.
13. Increase production of nutrient-dense foods.
14. Reduce postharvest losses and improve processing.
15. Increase market access and opportunities to improve smallholder incomes (especially for women) and consumer diets.
16. Reduce seasonality of food insecurity.

Supporting principles

17. Improve policy coherence.
18. Improve good governance for nutrition.
19. Build capacity in ministries at national, district and local levels, and increase nutrition staff.
20. Communicate and continue to advocate for nutrition.

PLANNING A NUTRITION-SENSITIVE APPROACH

In this section, we describe the planning component of the nutrition-sensitive approach to aquatic agricultural systems research in Malaita, Solomon Islands, in context of the guiding principles (FAO 2013). The guiding principles for a nutrition-sensitive approach have some parallels with the AAS research-in-development approach, described in further detail below. In brief, the AAS research in development approach promotes six *ways of working*: (1) focusing on building partner capacity; (2) working strategically in effective partnership to progress development; (3) conducting research, as much as possible, according to participatory action research principles; (4) fostering social equity through a gender-transformative approach; (5) investing in learning and networking; and (6) engaging through long-term commitments in specific places, and with particular partners.

Principle 1: Incorporate explicit nutrition objectives

The theory of change for sustainable farming in Malaita hub emphasizes that a nutrition-specific objective is a clear requirement in order to achieve hub development outcomes. An overarching nutrition research question is “What constitutes a nutrition-sensitive approach to integrated farming in the hub context and how does it influence outcomes from improved farming practices?”

Planned nutrition research and interventions have been informed by activities undertaken to gain a better understanding of nutritional issues from a community perspective (see principle 2) and will be conducted in conjunction with research designed to answer a related research question: “How can farming practices be improved to provide sustainable and equitable increases in system productivity, income and nutrition for women, men and children?”

Principle 2: Assess the context

Context assessments are advocated in order to build on existing effort, knowledge and resources and thereby maximize effectiveness of programs and interventions (FAO 2013).

From the perspective of Solomon Islands, the main areas of focus for the context assessment were (1) understanding who the existing stakeholders active in nutrition were and (2) assessing the root causes of nutrition problems at the community level.

In 2015, we undertook a nutrition stakeholder mapping and gap analysis through interviews with key stakeholders. The purpose of this analysis was to identify research, government and nongovernment organizations active in the “nutrition space” in Solomon Islands to which the program should align.

Key nutrition stakeholders in Solomon Islands

The Ministry of Health and Medical Services is the primary actor in the Solomon Islands’ health system; it functions as a funder, regulator and provider of nearly all services. In recognition of the double burden of disease that Solomon Islands faces, the ministry has increased focus on nutrition in recent years. Central to nutrition activities is the nutrition unit within the Maternal and Child Health Division of the ministry. The nutrition unit coordinates the development of national policies and guidelines for public health nutrition and is involved in the implementation of national and provincial-level public health programs and collection of national data. The nutrition unit has developed and implements a nutrition awareness program, mostly working through faith-based organizations and focused primarily on urban areas. Notably, two large national surveys are being conducted in 2015 through the Ministry of Health and Medical Services and the National Statistics Office: a follow-up to the World Health Organization (WHO) STEPwise approach to surveillance of noncommunicable disease risk factors from 2006, and an update of the 2006–2007 Demographic and Health Survey. The results of these two surveys, when available, will provide valuable up-to-date information on the state of nutrition in Solomon Islands.

World Vision implements a community-level maternal and child health and nutrition program in several provinces of Solomon Islands, along with other programs on water, sanitation and hygiene; disaster risk reduction; gender;

emergency response; education; and economic development. Within the maternal and child health and nutrition program, baseline surveys, including assessment of anthropometry, anemia (via collection of blood samples) and certain dietary practices, have been published for the communities in Malaita where World Vision works (Schneider 2012). Other development organizations, including Save the Children, also focus their education programs on sanitation and hygiene, an important component of a nutrition-sensitive approach.

A number of agriculture organizations, including the Ministry of Agriculture and Livestock, AVRDC – The World Vegetable Center, and Kastom Gaden Association, focus on sustainable food production. Although these organizations do not implement specific nutrition programs, they are involved in research and projects that promote the production and consumption of nutrient-rich crops, also important components of a nutrition-sensitive approach.

The Secretariat for the Pacific Community (SPC) is a regional organization with a strong presence in Solomon Islands. SPC has been active in various nutrition research projects and has nutrition resources available on its website. SPC also manages a youth-at-work program—an internship for unemployed youths—that has a plan to undertake nutrition education and promotion of healthy lifestyles in schools.

FAO is working on several projects in the Pacific region related to local food production with an integrated nutrition component. At a policy level, FAO is working with the Solomon Islands government to develop its capacity to improve and implement food security, nutrition and sustainable agriculture policies.

Within the nutrition sector, WHO in Solomon Islands primarily supports the capacity development of the Ministry of Health and Medical Services. For example, WHO is currently providing technical support to operationalize the fortification of wheat flour (with folic acid, iron, niacin, riboflavin, thiamine and zinc). The local flour mill, which provides 95% of flour consumed in Solomon Islands, is expected to be producing fortified flour in 2015. Fortified food can provide a supply of select micronutrients to entire populations without waiting for long-term changes in food habits or dietary behavior.

Community-level nutrition issues and potential solutions

Within the Malaita hub, WorldFish and associated partners work with selected communities using participatory research approaches and aim to synthesize scalable lessons. In Malaita hub, three community clusters in North Malaita (Kwai/Suafa, Fumato’o and Alea) have been identified to be the focus of community-based activities (AAS 2013). The villages within these clusters have varying reliance on the land and sea—Kwai/Suafa and Fumato’o clusters have greater reliance on the sea, whereas Alea cluster encompasses villages with good access to land for agriculture as well as nearby artificial islands that are heavily reliant on the sea.

In 2015, qualitative participatory nutrition research was undertaken with two of the three community clusters in North Malaita (Alea and Fumato’o) in order to understand and document the causes of specific nutrition issues (and potential solutions) from the community perspective. The third cluster (Kwai/Suafa) was unable to be included in this analysis due to unforeseen events within the community at the time of community engagement. A problem and solution tree approach was used and involved a series of focus group discussions with male and female fisher-farmers and key informant interviews with community leaders, clinic nurses and teachers. In total, 10 focus group discussions were held, involving more than 35 men and 70 women.

Problem and solution tree analysis starts with a problem, represented by the trunk of the tree. The roots of the tree represent the factors contributing to or the causes of the problem. The causes are identified by asking, “Why is this the case? What is the cause of this?” This line of questioning continues until the analysis reaches a point where no further causes can be identified. The leaves of the tree represent the impacts or outcomes of the problem. During this study, the problem was defined by focus group participants through the identification of the main foods consumed either too little or too much by adults and children in the communities, resulting in impacts on people’s health (Figure 3).

Once the problem tree was created, participants were asked to think about what could be done (specifically, what the communities themselves could do) to improve or change the underlying causes of the nutrition problem they had identified. This then created the solution tree, highlighting potential interventions to address the root causes of the nutrition problem.

Nutrition problems

In general, excess consumption of imported foods such as rice, instant noodles and ring cake (donut) and inadequate consumption of fruits and vegetables (particularly green leafy vegetables) were identified as the main dietary problems having the biggest negative impact on the health of adults and children.

Several common themes as to the causes of these nutrition issues emerged (summarized as a problem tree in Figure 3):

- **A preference for imported foods.** Rice, noodles, ring cake and canned tuna have become common staples in households due to convenience and taste preference. Rice was said to feed more people and has a longer shelf life compared with local foods such as sweet potato, is readily available in

local stores, and is fast to cook compared with local staples such as sweet potato and yam. Ring cake is a convenient breakfast and snack option due to availability in the village and schools (often marketed by women). Noodles in particular are preferred for “taste” by children and adults alike, particularly as the instant noodles include a flavor sachet. Many people noted that “slippery cabbage is only eaten with noodles or tuna these days as there is no good taste without it.” Children are increasingly eating instant noodles (often dry) as a snack food, often sourcing their own money to purchase noodles through, for example, selling coconuts to local copra (dried coconut meat) producers.

- **A cultural shift.** Communities reflected that eating rice and noodles is becoming the new norm. There is a general lack of interest in local foods, and parents are increasingly being challenged to appease their children, who are asking for such foods. This is coupled with a general trend toward a market-based economy, which creates the opportunity to access money through the sale of local commodities—being then used to buy imported foods, which are perceived to have a higher “wealth status.”

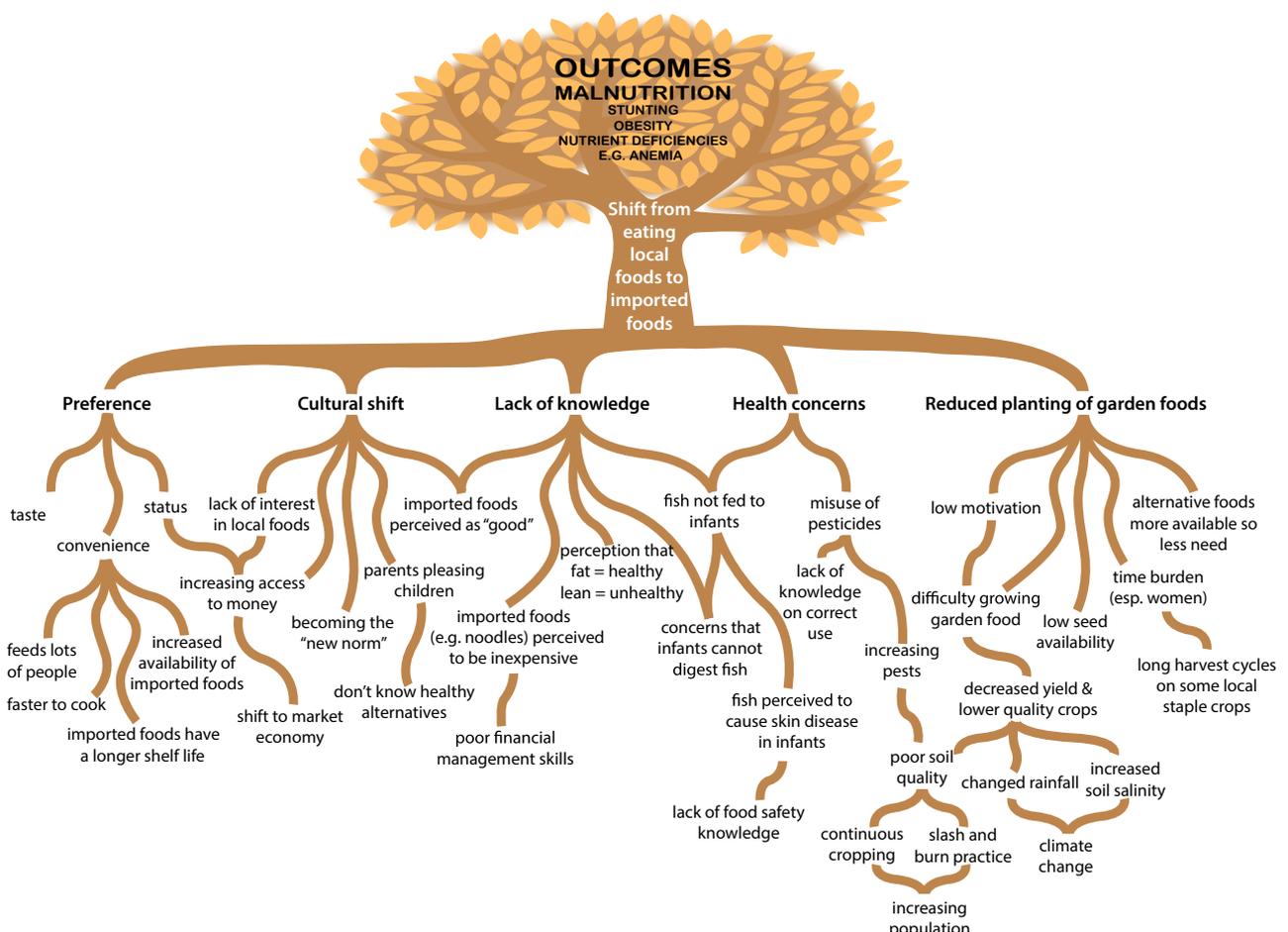


Figure 3. Community-derived nutrition problem tree.

- **Lack of knowledge.** An overriding lack of knowledge regarding the nutritional value of foods was apparent for the majority of women and men involved in focus group discussions, with comments received during focus group discussions such as “we didn’t know ice block [a frozen water and sugar treat] is unhealthy.” This coincided with the perception that imported foods such as noodles were inexpensive and were “good”.
- **Health concerns.** Concerns over the increasing use of pesticides (by untrained farmers using inappropriate pesticides) has reduced the consumption of some vegetables, particularly slippery cabbage and beans. In a number of communities, fish are not provided to infants and young children due to the belief that young children cannot digest fish, or that fish causes a skin disease in infants. In many cases, children were not given fish until they were at least 2 years old, therefore limiting their source of protein and essential micronutrients, which animal-source foods provide.
- **Challenges in agriculture.** Communities identified reduction in planting of garden foods as contributing to the shift in diets. Rural farmers are increasingly unmotivated to plant local foods due to reduced crop yields. Reduced yields were attributed to reduced soil fertility, increased pests and lack of seeds. The time that gardening requires was considered a burden, particularly for women (given the long harvest cycle for some crops and lack of men participating in garden activities). Alternatives are available (e.g. rice), so there was considered to be less need to grow local foods.

Notably, a lack of fresh fish was not identified as a dominant nutrition issue for adults. Some participants, however—particularly those from villages further inland (within the Alea cluster)—indicated they did not regularly consume fish, as they were not regular fishers and the cost to buy fish at markets was considered high. This does not explicitly reflect the availability of adequate fish supply. Communities within Fumato’o cluster were concerned about the declining fish stocks, to the extent that they established community-based marine resource management areas, and fishers from artificial

islands within the Alea cluster have turned to gardening as declining fish stocks have reduced the economic viability of fishing as a source of income (WorldFish unpublished data).

The delayed feeding of fish to infants and young children identified by some of the focus groups is particularly alarming, as fish are an important source of essential micronutrients required for normal growth. At a national level, only 21% of breastfed children and 38.5% of non-breastfed children under 2 years of age were found to consume protein-rich foods, such as meat, fish, poultry and eggs (Solomon Islands National Statistics Office et al. 2009). The delayed feeding of fish to infants warrants further research across the focal communities and more broadly at a national level.

Proposed solutions to nutrition issues

The participatory problem and solution tree analysis used in the context assessment enabled the community members to not only identify nutrition issues and their causes but also to identify potential solutions.

- **Education and awareness.** An overriding solution identified among all participants was the basic need for nutrition education and awareness, targeting all community members, but focused on women as the primary caregivers. It was emphasized that education needs to be simple, be context-specific and include practical alternatives to unhealthy foods. For example, in order to reduce noodle consumption, people would like ideas on alternative ways to flavor foods. This generated discussion around the potential of practical cooking classes or demonstrations, with local markets identified as an appropriate avenue for such an activity. Local markets were also identified as an appropriate avenue for “nutrition marketing,” where the benefits of specific healthy foods could be advertised by the sellers. For example, colorful laminated signs could advertise vitamin A-rich bananas as “good for the eyes.” The numerous discussions about parents wanting to please children (and therefore giving them ice blocks and ring cake) also indicates a need for education to include practical solutions for soothing children who are demanding unhealthy foods. Another interesting solution was financial management education and

training so that the real cost of imported food like noodles (perceived to be cheap on an individual packet basis) for a family over a month could be understood and compared to costs of cheaper and healthier alternatives.

- **Agricultural food production.** Proposed solutions related to gardening and food production issues centered on soil management, crop diversification and seed saving training, which are in line with current community action plans and existing WorldFish and partner activities (Kastom Gaden Association and AVRDC – The World Vegetable Center). The context assessment does, however, provide further areas for consideration in order to enhance sustainable agriculture, including pesticide management and focusing on production of foods with shorter production times and higher nutrition content.
- **Regulation of imported foods.** One participant identified government regulation of imported foods as a potential solution.

Nutrition program opportunities

The context assessment has enabled an in-depth understanding of the nutrition issues at community level. Based on this analysis, nutrition transition is occurring in North Malaita and in Solomon Islands more broadly (Andersen et al. 2013; Jones et al. 2014), with an increased consumption of imported foods and reduced consumption of more nutritious, locally derived foods. If this trend continues without appropriate interventions, this will likely compound existing national nutrition issues such as child stunting and adult obesity. The problem and solution tree approach has provided a basis for the identification of programmatic opportunities to improve nutrition in rural communities in Solomon Islands.

- **Community-level awareness and education.** Despite the efforts of national and provincial governments (through the provision of rural health clinics with maternal and child health nurses and nutrition awareness programs), the problem tree analysis highlighted the lack of nutrition knowledge at the rural community level. Multiple strands of endeavors will be required to improve rural people’s awareness

of the importance of an adequate intake of nutritious foods to improve human health, particularly for women and children.

- **National nutrition policies and programs.** There are a number of existing national and regional nutrition-related policies in Solomon Islands, including the regional Framework for Action on Food Security in the Pacific, the National Nutrition and Healthy Lifestyle Plan (2007–2017) and the National Food Security, Food Safety and Nutrition Policy (2010–2015). Yet, there is limited evidence that these plans and policies have been implemented at a national scale (Grieve et al. 2013). An important national action plan currently in draft form is the Framework for Action on Local Food Promotion in the Solomon Islands “*Kaikaim lokol kaikai*.” This framework “provides the basis for action by both public and private sectors to promote local food production and consumption for the health, socio-culture, environment, economic and food security for Solomon Islands people” (Solomon Islands Government 2014). Sufficient capacity and support will be required to enable governments to implement action plans to support these nutrition policies and frameworks. New policies may also be required to mainstream nutrition within broader rural development (including the fisheries and agricultural sectors) and for the regulation of imported foods, especially those with low nutritional quality (e.g. noodles).
- **Programs to reduce micronutrient deficiencies.** The context analysis suggested that in general, rural communities have access to a number of local garden products with high nutritional quality, although there were challenges of declining productivity and periods of hardship. Unhealthy diets seemingly stem from a lack of awareness of what foods constitute an adequate diet, leading to poor diet choices. While food fortification programs, such as the flour fortification that is currently being implemented in Honiara, are a step towards dealing with micronutrient deficiencies, this does not address the root cause. Further understanding is required of the barriers to healthy eating and the potential motivators for transformational change.

Principle 3: Do no harm

The AAS participatory action research approach is a strength-based approach that recognizes and aims to strengthen people's capacity to innovate using the resources available to them. The principles that guide participatory action research design and implementation are one mechanism of ensuring no unintended harm is caused.

Principles that guide participatory action research design and implementation (Apgar and Douthwaite 2013) are as follows:

- The process is owned by participants themselves, who define their real-life problems to be addressed through participatory action research.
- Participatory action research recognizes multiple voices and power relations and, to ensure equity, requires facilitation to be mindful of who is participating and how they are participating.
- Participatory action research emphasizes jointly shared responsibilities for collection of data and its analysis to support improved understanding and improved action.
- Results of the process are fed back to the participants for ongoing learning that is potentially transformative.

A second mechanism to ensure that no harm is caused is the use of a detailed understanding of existing social and gender norms when designing interventions. As part of AAS, a benchmarking analysis has been conducted in AAS focal communities. Through this process, existing norms and disparities that inhibit women's and men's ability to make transformational change have been identified. These include, for example, existing limitations on the time that women have available to participate in activities to improve household nutrition.

Principle 4: Measuring impact through program monitoring and evaluation

The AAS monitoring and evaluation system has five elements: performance reporting, outcome monitoring, monitoring and evaluation for learning, information management, and evaluation research (Douthwaite et al. 2014). Monitoring and evaluation for learning and outcome monitoring are the two main areas for

measuring impact. Monitoring and evaluation for learning is based on participatory action research processes within which after-action reviews and regular reflection with stakeholders (at community and hub level) provide avenues for continued learning. Monitoring of outcomes is intended to track the goal of the program in terms of long-term impact through an agreed set of intermediate development goals. Nutrition-related intermediate development outcomes for the program include improved diets for resource-poor and vulnerable people, improved food safety, and improved human and animal health through better agricultural practices.

In order to assess nutrition outcomes, during 2016 a baseline nutrition survey will be undertaken in partnership with the Ministry of Health and Medical Services in North Malaita focal communities (with mid-point and end-point surveys to be undertaken in future years). The baseline survey will utilize the dietary diversity of women and infant and young child feeding practices as primary indicators to document improvements in nutrition. Once the baseline survey has been completed, the results from the survey, together with the context assessment and available national data, can be utilized to revise the theory of change for sustainable farming in Malaita hub. This will provide the basis to deepen the impact pathways for nutrition and ensure that appropriate indicators are being measured to link activities with outcomes and longer-term impact.

Principle 5: Maximize opportunities through multisector coordination

Effective partnerships are central to a research-in-development approach and essential to achieving development outcomes at scale. For Solomon Islands, the AAS scoping process highlighted a number of challenges and opportunities for agriculture and fisheries partnerships in Malaita hub (Schwarz et al. 2013). For the agricultural sector in particular, it was clear that research partners would need to be identified and cultivated, as WorldFish is the only CGIAR Center with a permanent presence in Solomon Islands, and the formal AAS agricultural partners (Bioversity and the International Water Management Institute) do not work in Solomon Islands.

In-country agricultural partners, including AVRDC – The World Vegetable Center, Kastom Gaden Association, and the Ministry of Agriculture and Livestock Development, have been involved in AAS since rollout. A more formalized relationship was initiated with AVRDC – The World Vegetable Center in 2013.

In 2015, through AAS-supported partner capacity development funds, agricultural partnerships were fostered to support research in development for sustainable farming in Malaita hub. During the development of a coalition of partners, a lack of nutrition stakeholders was identified. The nutrition stakeholder mapping exercise was the first step towards filling this gap. First and foremost, developing a strong partnership with the Ministry of Health and Medical Services was recognized as essential to ensuring the research is addressing national priorities, as well as to enable synergies with existing programs. Efforts have since been made to develop a partnership with the nutrition unit of the ministry, which is now a key partner in aquatic

agricultural systems research, although efforts will be required to maintain and strengthen this partnership.

Existing partnerships with agriculture research organizations, including the Ministry of Agriculture and Livestock Development, AVRDC – The World Vegetable Center, Kastom Gaden Association, Solomon Islands National University, and the United Nations Entity for Gender Equality and the Empowerment of Women, will be essential to ensuring nutrition is integrated within sustainable agriculture production and markets to have greater impact through improved nutrition.

Broader partnerships, including those with locally based NGOs such as World Vision, SPC and Save the Children, will be important for a nutrition-sensitive approach, particularly as priorities focus on addressing other underlying causes of malnutrition such as sanitation and hygiene (which are areas of focus for these organizations).



Selling garden produce at Alea market, North Malaita.

Principle 6: Maximize impact of household income on nutrition

Principle 7: Increase equitable access to productive resources through policies and programs

Principle 8: Target the most vulnerable groups, including smallholder farmers, women, and resource-poor and food-insecure households

Through AAS, WorldFish and partners work with smallholder fishers and farmers to help them overcome poverty, malnutrition and food insecurity using a research-in-development approach. The overarching AAS objectives are analogous to guiding principles 6, 7 and 8:

- increased benefits to aquatic agricultural system-dependent households from environmentally sustainable increases in productivity
- improved markets and services available to resource-poor and vulnerable households in aquatic agricultural systems

- strengthened resilience and adaptive capacity in resource-poor, vulnerable and marginalized groups and households
- reduced gender disparities in access to and control of resources and decision making through beneficial changes in gender norms and roles
- improved policy and formal and informal institutional structures and processes implemented to support pro-poor, gender-equitable and sustainable development
- productive relationships, partnerships and networks capable of achieving research and development outcomes sustained through effective knowledge sharing and learning.

By adopting a gender-transformative approach in order to empower women and men through transforming social norms and power relations, AAS seeks to achieve equitable systems and structures that lead to better development outcomes. This approach will help guide agricultural interventions to ensure that unintended outcomes such as, for example, increasing household income at the expense of nutrition, are managed.



Marketing cooked fish at Auki market, Malaita.

IMPLEMENTING A NUTRITION-SENSITIVE APPROACH (DOING)

The context assessment (principle 2) was a key phase in the planning process that helped identify research and interventions that begin to form the implementation of a nutrition-sensitive approach for aquatic agricultural systems. In Solomon Islands, WorldFish and partners adopt a nutrition-sensitive approach by focusing on food security and quality, which is one of the underlying determinants of malnutrition. This focus will be achieved through research-in-development activities and interventions within the four pillars of food security described below, while keeping in mind the eight “doing” principles of the nutrition-sensitive approach listed earlier:

- availability: increasing availability of nutritious foods through household-level backyard fish aquaculture and improving nutritional quality of foods through improvements in soil quality and farming practices (principles 12, 13, 14, 15 and 16);
- utilization: nutrition awareness and education at the community level to empower communities to make better

informed decisions about household food consumption and farming practices (principles 9 and 10);

- access: ensuring the equitable sharing of improved farming technology across Malaita hub and beyond, by creating spaces for farmer-to-farmer learning;
- stability: working with communities and governments to create an enabling environment for improved nutrition through community-based management of natural resources (principle 11).

The context analysis also highlighted the importance of a multisectoral approach (principle 5) to address other underlying and basic determinants of malnutrition. Future activities will need to leverage partner expertise on care resources and practices, as well as sanitation and hygiene (e.g. World Vision and Save the Children), and continue to work with partners to build national and local capacity to develop and implement nutrition-related policies and frameworks (principles 17 and 19).



A family sharing a meal.

SUPPORTING PRINCIPLES TO ENABLE A NUTRITION-SENSITIVE APPROACH

The supporting principles for a nutrition-sensitive approach are those that enable programs to achieve nutrition impact. These principles will be important to scale impact from community to hub, national and regional levels. The nutrition-sensitive approach to sustainable farming research in Malaita hub is aligned with the strategies within the existing nutrition-related regional and national policy frameworks and action plans. Yet, as outlined above, there are opportunities to ensure that

nutrition-related policies at the national and regional level mainstream nutrition within broader rural development and that sufficient capacity is available to support and enable improved nutrition outcomes for Solomon Islands and the Pacific region more broadly. Research in development at the community level will be able to provide information and data to support appropriate policy development and action planning.



Nutrition focus group discussion with women in Alea cluster, North Malaita.

CONCLUSION

The best practice principles for developing a nutrition-sensitive approach to agricultural and rural development have provided a useful guide for planning such an approach for aquatic agricultural systems research in Solomon Islands. The context assessment in particular, including the nutrition stakeholder mapping and the nutrition problem analysis with communities, provided the basis for the identification of appropriate nutrition research and interventions.

Revisiting the best practice principles will be important to ensure that research activities continue to adopt a nutrition-sensitive approach. In particular, the supporting principles will be important in scaling from community to hub, national and regional level impacts. Ongoing partnerships with government and nongovernment organizations will be essential, as will be the human and resource capacity to implement action plans to support improved nutrition policies and frameworks.

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Approximately 500 million people in Africa, Asia and the Pacific depend on aquatic agricultural systems for their livelihoods; 138 million of these people live in poverty. Occurring along the world's floodplains, deltas and coasts, these systems provide multiple opportunities for growing food and generating income. However, factors like population growth, environmental degradation and climate change are affecting these systems, threatening the livelihoods and well-being of millions of people.

The CGIAR Research Program on Aquatic Agricultural Systems (AAS) seeks to reduce poverty and improve food security for many small-scale fishers and farmers depending on aquatic agricultural systems by partnering with local, national and international partners to achieve large-scale development impact.

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