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**POST-HARVEST PRACTICES FOR EMPOWERING WOMEN IN
SMALL-SCALE FISHERIES IN AFRICA**

Successful outcomes and guidance



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SMALL-SCALE FISHERIES IN AFRICA**

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by

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Preparation of this document

To support the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries (SSF Guidelines), the FAO Fisheries and Aquaculture Division developed the SSF Umbrella Programme and lined up a number of initiatives, including the Enhancing the contribution of Small-Scale fisheries to food security and sustainable livelihood through better policies, strategies and initiatives project (GCP/GLO/645/NOR). Under this initiative, in its extension for 2020, the Empowering women in small-scale fisheries for sustainable food systems project focused on sustainable food systems, targeting national- or local-level activities to support women working in the post-harvest sector of small-scale fisheries in five countries: Ghana, Malawi, Sierra Leone, Uganda and the United Republic of Tanzania.

In order to support long-term capacity building for women, the SSF Umbrella Programme conducted a review to identify successfully adopted post-harvest best practices that should be disseminated more widely to benefit women in the post-harvest sector.

Contents

Preparation of this document	iii
Abbreviations and acronyms	vi
1. Background	1
2. Infrastructure	3
2.1 Examples and benefits of identified best practices in infrastructure developments	3
2.1.1 Design considerations	3
2.1.2 Management of infrastructure	6
2.2 Normative guidance and recommendations on the design, use and management of infrastructure	8
3. Improved post-harvest technology	9
3.1 Examples and benefits of identified best practices in post-harvest technologies	9
3.2 Normative guidance and recommendations in post-harvest technologies	11
4. Value addition	13
4.1 Key aspects of value addition, packaging and marketing	13
4.2 Normative guidance and recommendations on value addition, packaging and marketing	16
5. Access to finance	19
5.1 Examples of finance models	19
5.2 Normative guidance and recommendations on access to finance	21
6. Conclusions	23
References	25

Abbreviations and acronyms

ABS	Albert Bosomtwi-Sam (Fishing Harbour, Ghana)
CLPAs	Local Committees for Artisanal Fisheries (from French “Comité local de la pêche artisanale”)
FAO	Food and Agriculture Organization of the United Nations
FDA	Food and Drugs Authority (Ghana)
GIE	Groupement d’Intérêt Economique (Economic Interest Group)
GPHA	Ghana Ports and Harbours Authority
GSA	Ghana Standards Authority
MECPROPARC	Credit and Savings Society for the Development of Fishing in Joal (Senegal)
MECPROPEM	Credit and Savings Society for the Promotion of Fishing in Mbour (Senegal)
SSF	Small-Scale Fishery
VICOBA	Village Community Bank
VSLA	Village Savings and Loans Association
WWF	World Wide Fund for Nature

1. Background

Small-scale fisheries (SSFs) support millions of rural communities in terms of food and nutrition, income and employment. They support approximately 90 percent of the world's capture fishers and fishworkers (FAO, 2015). These support functions are spread across the value chain, from pre-harvest, harvest to post-harvest. Women's role in SSFs is crucially important, as they account for an estimated 47 percent of fishworkers and contribute approximately 56 million jobs, primarily in post-harvest nodes such as processing and trading (World Bank, 2012). SSFs also hold significant cultural importance as a way of life for some communities, as well as representing historical links to adjacent fishery resources and support to social cohesion.

Despite their importance, in general SSFs are perennially overlooked and marginalized in policy and funding support. This is a result of their perceived unimportance in national economies, which is due to a lack of the data needed to demonstrate their contribution (FAO and WorldFish Center, 2008). In terms of gender, although women's contribution in the fisheries sector is massive, their work is often undervalued, overlooked or under-represented in official statistics due to a lack of sex-disaggregated data (FAO, 2017). This in turn translates to inadequate funding for the economic sectors in which women are concentrated, such as the post-harvest sector.

SSFs face numerous fishery-related challenges and threats, such as climate change, habitat deterioration and loss of biodiversity, overfishing resulting in dwindling stocks, poor enforcement, and conflicts with large-scale fishing actors. Post-harvest challenges facing SSFs include: lack of adequate facilities and equipment across the value chain; expensive and inaccessible processing technologies; high cost of value addition, labelling or packaging; low technical and financial capacity to meet certification standards; and poor access to adequate finance.

These post-harvest challenges have been the focus of numerous projects, programmes and investments in Africa. Learning from past and current initiatives in order to inform future development activities has the potential to improve the efficiency of interventions and the likelihood of future initiatives having successful outcomes.

Based on the premise that there is a lack of documented learning from past and current practices or that such learning is not easily accessible, this overview aims to showcase some identified successful outcomes from past and current initiatives in small-scale African post-harvest fisheries. Primarily, the overview provides examples of successful uptake or replication of ideas, technology, practices or services that have benefited or are benefiting women in post-harvest fisheries and could inform future initiatives.

Secondary data sources were reviewed and communications made with key stakeholders. This helped plan a primary data collection exercise focused on particular interventions in Ghana, Malawi, Senegal, Sierra Leone, Uganda and the United Republic of Tanzania. This report provides a summary of key findings from the desk review and primary data collection. It describes initiatives according to: (i) infrastructure design and management; (ii) adoption of new or improved technology; (iii) value addition; (iv) standards and certification; and (v) access to finance.

The report and guidance align with and aim to support the implementation of the FAO Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food

Security and Poverty Eradication (SSF Guidelines). The SSF Guidelines were developed as a complement to the 1995 FAO Code of Conduct for Responsible Fisheries (CCRF). The SSF Guidelines seek to enhance the contribution of SSFs to global food security and nutrition, the right to adequate food, equitable development and poverty alleviation, and to the provision of decent work for fishers and fishworkers.

The SSF Guidelines call upon states to promote investment in human resource development, for example through investment in health, education, literacy, digital inclusion and other skills of a technical nature that generate added value to fisheries resources, as well to foster social development, employment and decent work while promoting gender equality. The SSF Guidelines support women's participation in post-harvest activities, while mainstreaming gender as an integral part of all SSFs development strategies. The SSF Guidelines promote access to services that are appropriate for small-scale fishing communities with regard to, for example, savings, credit and insurance schemes, with special emphasis on ensuring women's access to such services.

2. Infrastructure

Fisheries infrastructure is usually a public resource and has been the focus of major interventions by governments and donors. In the context of this publication, fisheries-related infrastructure includes landing sites, harbours, processing facilities and wholesale and retail markets. Infrastructure is important in enabling producers to organize, handle, sell and store fish and fish products in an efficient and hygienic manner that complies with required standards.

The SSF Guidelines call upon states to promote decent work for all SSF workers, including those in the informal sector and, in particular, vulnerable women processors and traders. States should also address occupational health and safety and unfair working conditions, and incorporate consultation and participation of small-scale fishing communities in decision-making processes.

The SSF Guidelines highlight the need for appropriate amenities and services to enhance the livelihoods of women in the post-harvest sector, and note how states should provide and enable investments in appropriate infrastructure to support post-harvest activities. This promotes the marketing of good-quality and safe fish and fishery products for both export and domestic consumers. Basic principles of design and planning of infrastructure – including the installation of fundamental services such as water supply, electricity and roads – are also seen as crucial. Figures 1 to 4 below show examples of infrastructure.

2.1 EXAMPLES AND BENEFITS OF IDENTIFIED BEST PRACTICES IN INFRASTRUCTURE DEVELOPMENTS

Based on the criteria discussed, several fish landing sites, processing facilities and markets were identified as exhibiting good practices in design, use and management of facilities.

2.1.1 Design considerations

Most facilities exhibiting signs of good practices incorporated stakeholder input during conception, design and construction, in line with national and international standards for the basic services expected at landing sites.

Landing sites generally consist of wharfs with extensive concrete landing platforms or jetties, concrete floors and slabs for receiving fish, paved roads, a parking area, a perimeter fence, net mending areas, boat engine repair shops, offices for management staff, fuel stations, cold chain systems (such as ice plants), fish markets, processing sheds and rooms, toilet facilities, drainage systems and waste disposal facilities. Water and electricity are also available at most sites. Most of these landing sites also have reserve land for extension and development. Landing sites exhibiting best practices in terms of design and construction were Tema Canoe Basin fish landing site and Albert Bosomtwi-Sam (ABS) Fishing Harbour in Ghana; Joal and Mbour fish landing sites in Senegal; and Kiyindi in Uganda. These facilities are designed to cater for the needs of different types of users, including fishers, traders, input dealers, food sellers, water sellers, mobile money merchants, transport operators, consumers, etc.

FIGURE 1. Fenced fish market and well-demarcated car park at ABS fishing harbour, Ghana



FIGURE 2. Administration block at ABS fishing harbour constructed during the second phase of improvement, Ghana



FIGURE 3. Fish mammies waiting for fish under sheds in Tema Canoe Basin, Ghana



FIGURE 4. Panyimur market, Uganda



In terms of infrastructure that facilitates fish processing, Mballing and Cayar processing units in Senegal, and Kiyindi in Uganda, operate according to an onward flow principle, whereby successive production operations ensure a forward progression of products without back return. This reduces cross-contamination risks. These processing sites also have good sanitation facilities, such as toilets and washing facilities, waste disposal facilities, drainage systems and water storage systems. The floors are made of materials that are easily cleaned and can withstand continuous washing. Some facilities such as Mballing and Cayar have spacious car parks available to customers with their own transport, and security watchtowers. The design of the infrastructure at the Mballing processing unit was an initiative of women processors and members of the *Bokk Liggéey Groupement d'Intérêt Economique* (GIE), with its various partners. It is well fenced and consists of two processing lines, one for salted-dried fish (including 13 state-of-the-art solar dryers called *Kiraye* and three wet waste workshops with cold rooms) and one line for smoked fish (including a braising area with 21 improved FAO-Thiaroye Processing Technique ovens). It also has two solar dryers for drying, a fish oil processing workshop and a storage unit. The Cayar processing unit has workrooms, a smoking area with improved fish smoking ovens, an area for braising, a preparation area, a drying area with drying racks and solar dryers, a washing and salting area, a storage room for processed fish and a salt storage shelter.

From the review of fish markets, Pikine Fish Market in Dakar – the largest fish market in West Africa with an area of more than 6 hectares – has several cold rooms, refrigerated containers, a generator and stalls for retail display showcases. It is a modern, well-designed market constructed through sustained public input. It was constructed in 1989 through funding from the Japanese International Cooperation Agency (JICA) and was expanded in 1998. In 2017, it was extensively rehabilitated by the Senegal Ministry of Fisheries and Maritime Economy, prompted by challenges such as chronic lack of electricity, shutdown of ice plants and cold rooms, insecurity and unsanitary conditions. The overall conditions of the market have since dramatically changed, leading to improved hygiene, safety and revenue collection.

2.1.2 Management of infrastructure

In terms of infrastructure and facilities management, national authority agencies typically devolve the mandate to local authorities through concessions. This devolved mandate is then shared between local operational committees incorporating users, private service providers and the local authority.

Devolved management from the central government to local authorities, and then to users under committees with a clear distribution of responsibilities, emerges as a best practice. Examples of devolved management can be seen at the fishing harbours in Ghana (Tema and ABS), which are under the main responsibility of the Ghana Ports and Harbours Authority (GPHA) as mandated by the Ghana Ports and Harbours Authority Act, 1986 (PNDC Law No. 160). The chief fishermen and fishers' councils play a major role in managing the landing site. The market queens, or *Konkohemaa* – women processors who are directly responsible for activities in the fish markets – also form part of the fishermen councils. The management committees hire service providers to provide cleaning services (Box 1). Involvement of these economic operators ensures continuous provision of services and is seen as a best practice.

Box 1. An example of a management model incorporating economic operators

Tema Harbour is managed by the chief fisherman and council, with oversight responsibility assigned to the Ghana Ports and Harbours Authority (GPHA). The leadership has created a social media platform (on WhatsApp) including the various fishermen associations, for easy dissemination of information to all stakeholders.

The council complements the cleaning of the harbour, which is done by a cleaning company contracted by the GPHA. The council collects landing fees in the form of fish landed for sale (one crate per canoe, equivalent to 30 kg). The proceeds from the sale of this fish serve to raise funds for the management of the facility. On average, the price of a crate of fish is USD 12 for common fish, while during peak season, a typical boat can land an average of 160 crates (approximately, 5 tonnes), for an estimated value of USD 1 937. Thus, the landing fees translate to approximately 1 percent of fish landings.

Funds are also generated from the sale of premix boat fuel. Currently, proceeds from premix fuel sales are being used to construct a hostel facility in the community secondary school. All water and electricity bills are paid to the GPHA for onward payment to the respective agencies.

In Senegal, the management of both Joal and Mbour landing sites was assigned to the relevant city councils through legislation on concessions. Then, through a sub-concession contract, the city councils handed over the management to the interprofessional *Diamo pêcheurs mareyeurs* GIE in Joal and the *Liggey Tefes* GIE in Mbour. The concession and sub-concession contracts involve various stakeholders in the management and maintenance of the structures. In addition to these various stakeholders, the Joal and Mbour Local Committees for Artisanal Fisheries (CLPAs) are in charge of validating the management measures taken by stakeholders. Pikine Fish Market also has a committee of delegates responsible for decision-making. Kiyindi landing site fish processing facilities and market facilities also feature a similar devolved management system, with committees and fish processor groups (for example, the Kiyindi Women Fish Processors Association) acting under the supervision of government officers, are responsible for managing the processing facilities.

User participation in management improves their ownership of facilities, increases their responsibility, and improves revenue collection, planning for operations and scheduling of maintenance regimes. This contributes to economic viability and sustainability of the services enabled by the infrastructure. For example, in the Joal landing site in Senegal, generated revenues in 2020 reached USD 214 418, against expenditures of USD 205 176 and a surplus of USD 9 242; Mbour's revenues for the same year were USD 170 425, against expenditures of USD 169 316 and a surplus of USD 1 109. In Tema Canoe Basin landing site, in Ghana, revenues were USD 2 154 399 against expenditures of USD 1 256 732 and a surplus of USD 897 666. These admirable outcomes were achieved through prudent management that incorporated users (via the committees) and engaged economic operators, which ensured efficiency.

Good organization and management appear to have implications for the usage of facilities and equipment, maintenance, cleanliness and provision of services (water, electricity and sanitation facilities). In Senegal, the Cayar processing unit has well-elaborated sanitation measures with regard to waste disposal, with the facilities used on a rotational basis by women processor groups. Pikine Fish Market is known to implement good hygiene practices, with approximately 154 staff (44 of whom are

women) in charge of cleaning and maintenance, as well as of other functions such as safety, quality control, accounting and technical responsibilities. In Ghana, the ABS fishing harbour applies standard operating procedures, which mainly reiterate the need to maintain hygiene, and has waste bins placed at vantage points to encourage good disposal of waste. The harbour also employs an estate manager, who is in charge of the cleaning and maintenance of the facility.

2.2 NORMATIVE GUIDANCE AND RECOMMENDATIONS ON THE DESIGN, USE AND MANAGEMENT OF INFRASTRUCTURE

The review suggested a number of recommendations in the context of the design, use and management of infrastructure, as outlined below.

- 1. Adequate and participatory design of the facilities and equipment enhances user acceptance.** Participation of local communities in the initial design of infrastructure is one of the success factors of infrastructural development. It creates ownership, as the communities perceive the facility as serving to address their problems. Other crucial considerations during conception of the infrastructure should include creating facilities at sites with relevant fishing activities or areas equipped with basic services (access roads, water, electricity, etc.) that can then be incorporated into the project to fully serve the facilities. As the number of users grows, it becomes necessary to expand the infrastructure. As such, adequate reserve land, good topography, and drainage must be secured during the conception stage.
- 2. Decentralize and clearly define the roles and responsibilities of public entities to enhance ownership.** Governments should decentralize operational management functions to local authorities and clearly define and document the responsibilities between the public entities, in order to enhance ownership.
- 3. Ensure participatory management.** In decentralization arrangements, governments should ensure that representatives of users are involved in the operation of the facilities and equipment. This promotes their sense of responsibility and, therefore, ownership.
- 4. Ensure involvement of economic agents in operations.** From the examples reviewed in this publication, it is clear that the role of economic agents (private-sector operators) is critical. They are able to undertake functions that governments, by their very nature, cannot. Economic agents are also motivated by a sense of business efficiency.
- 5. Design and implement Sanitation Standard Operating Procedures.** It is important to document Sanitation Standard Operating Procedures (SSOPs) as a necessary requirement to ensure that procedures are continually followed. Continued maintenance of high sanitation standards is reliant on such measures being put in place.
- 6. Enhance sustainability through prudent financial management.** A key driver of sustainable operational management of facilities and equipment was found to be inclusive management capable of collecting adequate revenues. It is recommended that government agencies, as the core stakeholders of fisheries infrastructure, institute measures to ensure inclusive management with adequate capacity and arrangements for revenue collection. Prudent financial management, supported by measures that streamline costs and improve efficiency, ensures retention of surpluses. This, in turn, leads to greater chances of viability and long-term provision of services.

3. Improved post-harvest technology

The introduction and uptake of improved technology can help enhance product quality and safety, reduce food loss and waste, achieve environmental benefits, operate costs and time savings, and improve working conditions.

Women – who often dominate the fish post-harvest sector – are highly reliant on technology, particularly in relation to fish processing by drying, salting and smoking. Processing is particularly necessary when there are inefficiencies or lack of a cold chain. Processing extends shelf life (by up to several months) and makes fish transportable over long distances.

The SSF Guidelines emphasize avoidance of post-harvest losses and waste, and seek to promote value addition, taking into account traditional and local cost-efficient technologies, local innovations and culturally appropriate technology transfers. Technology also has implications in the promotion of environmentally sustainable practices that avoid waste of inputs such as water and fuelwood. Such measures also encourage and support energy efficiency in the subsector, which is beneficial in combating climate change.

3.1 EXAMPLES AND BENEFITS OF IDENTIFIED BEST PRACTICES IN POST-HARVEST TECHNOLOGIES

The review looked at a number of improved processing technologies targeted at providing benefits to women. Examples with obvious potential for replication and uptake on a large scale are the use of locally made plastic containers for fish handling and raised drying racks.

Perforated plastic fish containers

What happens to fish on fishing vessels can have a major impact on the quality of fish available to women processors and traders, and has implications for food loss and waste. Any accessible initiatives related to improved on-board handling of fish destined for processing are therefore highly relevant to women. The review found examples of the adoption of locally made plastic containers to improve the on-board handling of small pelagics in Uganda (Figure 5). Perforated plastic jerry cans are widely used in Kiyindi, on Lake Victoria, for on-board handling and transportation of silver cyprinids (*Rastrineobola argentea*), locally known as *mukene*. These containers are cheaply made from empty plastic jerry cans, typically used for cooking oil. The sides of the jerry can are perforated and an opening is cut at the top. The containers provide the fish with some protection from physical damage, allow water to drain off, and reduce the risk of contamination. If there is spoilage, it will only occur in particular containers and not the whole catch. The container also facilitates unloading the catch and the subsequent transport of fish to the processing site.

FIGURE 5. Containers for small pelagics, Uganda



Adoption of drying racks for small pelagics

Traditionally, fish have been dried on the ground, in unhygienic conditions leading to contamination with sand and dirt. Improved technologies have been primarily focused on popularizing raised drying racks and solar driers. The review found evidence of successful uptake and replication of raised drying racks by women processors. Although solar driers have benefits in terms of process control and end-product quality, the review did not find evidence of wide-scale adoption of the technology. Where they existed, maintenance was inadequate for most.

Improved racks are efficient and reduce fish drying time from multiple days to eight hours, if conditions are right, due to better air circulation (Figure 6). Raised racks also enable fish to be dried in a cleaner environment. In addition, raised racks reduce menial work, as they are built at a height that does not require the user to bend down to handle and turn the fish during drying.

FIGURE 6. Drying racks, Uganda



In Uganda, drying *mukene* (*Rastrineobola argentea*) using racks has taken root. The racks are constructed using wood or metal, and the fish are placed on food-grade mesh netting tied to the frame. The racks were introduced by development initiatives and a private-sector enterprise, Arrow Aquaculture Africa (AAA) Company in Buikwe, which imported the concept from Lake Kariba, where raised racks are used to dry *kapenta* (*Limnothrissa miodon*). The rack concept has been widely adopted by processors on Lake Victoria. Racks are associated with improved product quality and reduced post-harvest losses. Processors credit the drying racks with enabling faster fish drying, resulting in an end product that is clean and free from sand because it is dried off the ground. Buyers acknowledge the improved quality and are prepared to pay prices at least two or three times higher than on-the-ground sun-dried *mukene*. Drying racks can reduce the loss of *mukene*. As better quality can be achieved, the use of drying racks has also spurred value-addition innovations such as packaging, labelling and product diversification (e.g. fried, salted and powdered *mukene*).

It is worth noting that the review also found that the uptake and replication of improved technology was impeded by weak planning, design, installation and associated business environment. Key barriers to technology uptake include:

- limited space at landing sites and processing units for adding equipment and infrastructure (for instance, drying racks commonly require more space than is available);
- reluctance of processors to change their traditional practices;
- the technology is not matched to the volume of fish typically processed;
- there is no price incentive to produce higher-quality products;
- the cost of investment in improved technology is excessive;
- piloted technology is not maintained or repaired, particularly in cases where processors were not consulted during design and construction; and
- low consumer awareness and appreciation of food safety and quality, and thus appreciation for improved-quality products.

3.2 NORMATIVE GUIDANCE AND RECOMMENDATIONS IN POST-HARVEST TECHNOLOGIES

1. **Involve end users in the design and adoption of post-harvest technologies.** Often, new technologies have glitches that are only identifiable during use. Working with end users during the design and testing phase will help identify problems and improve the design and the likelihood of adoption.
2. **Technologies must be affordable.** Small-scale fisheries processors are ready and willing to adopt and use affordable post-harvest technologies if these meet their needs. Processors often have limited financial resources for investment in new ideas and may be risk-averse. Low-cost technology will be more attractive and more likely to be adopted.
3. **Link with value addition.** Other important drivers of adoption have been to increase the product's value by improving quality, packaging, labelling and certification, thereby yielding better returns on investment in new technology.
4. **Encourage cost-sharing.** Joint cost-sharing of the initial investment in improved technologies between beneficiaries and promoters, such as government and donors, helps to improve adoption rate and ownership. This can be achieved by cofinancing in cash or in kind (provision of labour and materials during construction, etc.). The beneficiaries should also be capable of and responsible for future upkeep and maintenance.
5. **Governments should create an enabling business environment.** Economic incentives for improved products, assistance in product development, and raising awareness about quality and safety benefits of products can influence consumer behaviour and create distinct price differentiation that encourages demand for better-quality products and incentivizes processors to adopt improved technology.
6. **Encourage peer-to-peer exchanges. Peer-to-peer education approaches can help to increase adoption among processors.** In these approaches, successful adoption examples are promoted and used to extend technologies to other processors.
7. **Matching technology to needs.** Research and development should ensure that technologies strike a balance between processing capacity (in terms of volume of fish usually processed) and the cost of investment. The technology should be able to cope with the volume of fish, and the volume of fish should not exceed capacity.
8. **Innovation.** Research and development of improved low-cost technology to address key challenges, such as the drying of fish during rainy seasons, should be promoted. Innovations related to drying technology and the protection of drying fish from rain appear to be possible entry points.

4. Value addition

Value addition is the process of adding value to products (starting from raw materials), or adding “extra” features to a product (improving quality, making products more convenient or desirable, creating new products, reducing costs, etc.) which often results in greater economic value for the producer. It enables fishers, processors or traders to tap into new and higher-value markets. It may entail producing a fish product for a special or new market (diverting low-value fish from animal feed to the higher-value human consumption market); improving end-product quality through better hygiene, handling and processing practices; applying processing and preservation techniques and technologies such as dehydration and drying, smoking or freezing; development of innovative products such as fish powders or fish-based products; and changing how fish is packaged and labelled. Value addition can involve certification by food safety and standards bodies.

The SSF Guidelines emphasize value chains, post-harvest and trade, and underscore involvement of post-harvest actors in relevant decision-making, noting that women form the bulk of actors in this subsector. The SSF Guidelines recognize the central role of actors in the post-harvest subsector in the value chain, calling upon all parties to avoid post-harvest losses and waste, and to seek ways to create value addition. In addition, the SSF Guidelines note that there may be unequal power relations between value chain actors, and that vulnerable and marginalized groups such as women may require special support.

The SSF Guidelines recognize the importance of quality and safety of fish products, and impresses on states the need to facilitate investments in appropriate infrastructure, organizational structures and capacity development to support the SSFs post-harvest subsector in producing good-quality and safe fish and fishery products in a responsible and sustainable manner. Measures that improve product quality and therefore enable better access to markets are particularly useful to women, who, as mentioned dominate the SSF post-harvest sector. The measures should target both export and domestic markets. It is the responsibility of governments to establish uniform safety standards so that: (i) all consumers receive equal levels of protection; (ii) all food producers, whether domestic or foreign, are equitably treated through application of the same safety standards; and (iii) consumers are informed about the standards of protection being applied. Governments have a responsibility to help women and more vulnerable groups meet certification requirements.

Some of the benefits of value addition include: increased income; employment creation; improved food safety and security; nutritional benefits; and greater consumer confidence. Although promotion of value addition benefits small and medium enterprises and certain consumer groups, it may also inadvertently lead to diversion of inexpensive nutritious fish and fish products away from low-income consumers. These negative and positive benefits of value addition must be acknowledged and mitigated.

4.1 KEY ASPECTS OF VALUE ADDITION, PACKAGING AND MARKETING

The review has noted various examples of value addition in different countries. This section summarizes key features of successful value addition initiatives. Typical value-added products centre on smoked fish, powdered smoked or dried shrimps, powdered dried fish, or fried, grilled, and dried fish, sold as ready-to-eat snacks. Other products of note are fish

sausages, samosas and fresh fish fillets. Most, if not all, of these products are packaged in some form and labelled for retail sale. Dried fish powder has potential for use in school feeding programs, as it can be added to porridge or other local dishes to boost the nutrient content of meals for children. Figures 7 and 8 show examples of value-added products.

Value-added products tend to be produced using a variety of equipment, ranging from simple to complex. The complexity of equipment depends on the financial capability of the producer and type of end product. Most producers use simple equipment in production, depending on the type of species being processed and type of product to be produced. These include: bowls or baskets, knives, blenders, weighing scales, fish drying racks, improved smoking ovens, appropriate clothing (personal protection equipment), vacuum packaging machines, cold pressed machines, cutting machines and hammer mills. This demonstrates that value addition can be done with simple equipment at low cost. In some situations,

FIGURE 7. Packed and labelled value-added products produced in Ghana



FIGURE 8. Value-added mukene snack products produced in Uganda



processors rely on one another for more expensive technology, such as commercial hammer mills (used to produce fish powder).

Value addition requires access to energy sources such as fuelwood, charcoal and electricity, as well as to water and packaging materials such as plastic bags, plastic and glass bottles and jars. Labour involved in production is both skilled (for example, trained processors) and unskilled (such as porters and manual labourers).

Value addition is almost always associated with packaging of some form, as well as labelling and a variety of pack sizes ranging from 100 g to 1 kg. Producers have identified or created their own market niches and mainly target middle- and high-income consumers, in both local and export markets. Typical market outlets are supermarkets, gas station marts or sales directly to consumers. Nevertheless, value-added products are also bought by consumers with lower purchasing power, who opt for smaller-sized packs. Businesses are typically registered. Some have management structures and keep accounts.

Procurement managers of supermarkets are important stakeholders, as they are responsible for placing orders for products. Marketing is also done through a producer's own contacts; sometimes, social media may be used. Some producers have their own retail outlets.

An important challenge faced by many producers is the seasonality of raw material supply, with fish availability affected by the fishing seasons.

Value addition is associated with more advanced or higher standards of hygiene and handling. These can be national or international standards and involve the application of good management practices. National authorities have the mandate to certify that standards are being met; this is important for achieving market access and to show that products meet food safety requirements. Certification is credited with enabling access to better markets both locally and internationally, and has yielded desired benefits in terms of higher prices, incomes and reliable markets.

The review shows that the certification process in the countries studied follows similar steps, procedures and standards, based on Codex Alimentarius guidelines. Certification follows four basic requirements: (i) the business must be duly registered; (ii) the processing facility must be licensed and compliant; (iii) the facility must conform to all standards and pass conformity tests; and (iv) packaging and labelling must conform to standards. As part of licensing of facilities, inspections are carried out by the relevant food and drug authorities or bureaus of standards to ensure compliance. Certifications of analyses (analytical report) for each product and variant, label analyses of products, and confirmatory tests are undertaken as part of product registration. The tests cover both microbiological and physico-chemical parameters. They are also a requirement if a barcode is to be included on the product label. Box 2 summarizes product certification in Ghana.

It was noted that product certification improves customer confidence and acceptance, and therefore enables better sales at higher prices. This was observed among processors who had certified their products and credited their success to certification. However, despite the existence of standards for dried, powdered and other products, there has been a slow roll-out of certification schemes and application of standards in SSF value chains. Reasons include the high costs associated with upgrading equipment and facilities, the cost of certification and the lack of awareness of certification requirements and processes. In some cases, the varying roles and responsibilities of different players and regulating authorities has potential to confuse small-scale operators.

Box 2. An example of product certification process from Ghana

In Ghana, the Ghana Standards Authority (GSA) and the Food and Drugs Authority (FDA) are in charge of food industry standards regulation, and have 25 standards in place for fish and fishery products. Fish and fishery products produced for the local market are certified by the FDA, while the GSA is responsible for certifying fish and fishery products for export.

To encourage adoption of standards for SSFs in Ghana, the Class 1 Certification Scheme was developed as a collaboration between stakeholders in the fisheries sector: the Fisheries Commission, the GSA, the FDA, the National Fish Processors and Traders Association (NAFPTA) and academia (University of Cape Coast), with support from the United States Agency for International Development's Sustainable Fisheries Management Project (USAID/SFMP) and *Stichting Nederlandse Vrijwilligers* (Foundation of Netherlands Volunteers, SNV).

These stakeholders are also involved in a joint certification process. Under the scheme, a fish processor is issued with a certificate of recognition that is renewable every three years. To date, 20 fish processors have been certified under the scheme. There are plans by the FDA and the Ghana Enterprise Agency to progressively roll out the certification scheme to other enterprises.

Benefits reported by certified processors include improved marketing and linkages with institutions such as banks, government agencies and businesses, leading to better sales and profits. Also, locally, their products do not need to pass further standards inspections by buyers such as supermarkets.

4.2 NORMATIVE GUIDANCE AND RECOMMENDATIONS ON VALUE ADDITION, PACKAGING AND MARKETING

1. **Financing for value addition.** Many processors are self-financed due to difficulties in accessing external financing from major banks and financial institutions. Almost all of the processors interviewed self-financed their businesses, as the sole proprietors of their enterprises. Only a few accessed loan facilities from banks and microfinance institutions. However, Village Savings and Loans Associations (VSLAs) facilities have proved to be a good funding source for processors. There is scope to improve access to financing for investment and working capital for value addition, as well as to meet the costs associated with certification schemes.
2. **Access to market information for value-added products.** Processors have tended to identify and create their own market niches for value-added products that mainly target middle- and high-income consumers. However, access to and the use of market information is limited and more attention should be given to understanding consumer demand and trends.
3. **Product certification enhances market access.** Access to good and specialized markets requires product certification by national regulatory agencies. Efforts should be made by governments to make certification easy and affordable to obtain for producers.
4. **Promote small pelagics as a source of nutritious food.** Historically, small pelagics have been ignored as a source of food and as a product for value addition. In many places, small pelagics have historically been processed under unhygienic conditions, relegating them to animal feed and low-value products. This problem persists to this day. Efforts should be made through national campaigns to promote the nutritional and economic benefits of small pelagic fish as food and to boost demand where feasible.

5. **Promote awareness on value added products.** There is still great scope for value addition: most processors in Africa focus on traditional methods of processing fish (such as drying, frying and smoking). This type of primary processing limits the market reach of these traditional products. Many fish consumers are not aware of value-added products. Therefore, consumer awareness on the consumption of quality fish and fishery products should be increased, for example through advertisements, fish fairs, public campaigns and media.
6. **Facilitate access to necessary processing infrastructure and services.** National and local governments should be encouraged to commit funds for infrastructure such as cooling facilities, water and electricity supplies and processing rooms, besides ensuring clean markets and provision of public sanitation and storage facilities for fish traders and processors. Governments have the responsibility to ensure such infrastructure is properly managed, in order to promote the highest standards of hygiene and quality for fish processing as well as enable producers to meet national standards and certification requirements.
7. **Promote good fish handling at all levels as a prerequisite for value addition.** Fish quality is key to value addition and is inextricably linked to fish handling, from harvest to landing and processing centres. Therefore, governments should intensify training of fishermen, fish processors and traders on the handling and processing of fish, oversee adherence and enforcement of good fish-handling standards as well as promote access to the equipment, materials, services and facilities needed to implement good practices.
8. **Appraise skills of extension officers.** Government extension officers must be well trained and updated on international and national food safety standards, so that they can routinely train and raise awareness among processors on food safety standards, fish handling and hygiene maintenance.
9. **Make technology more affordable.** Some improved technologies for processing were found to be unaffordable for processors, many of whom are women. Policy measures to reduce the cost of technology, encourage local fabrication and the use of locally available construction materials, and facilitate access to credit are possible options to explore.
10. **Increase budgetary allocations for certification bodies.** Governments should increase the budgetary allocation to standards bodies, in order to effectively implement food safety standards and improve compliance regarding both fish for export and for local consumption. For SSFs, standards bodies should work towards helping operators attain necessary certifications.
11. **Harmonize standards legislation.** Governments should harmonize legislation and clearly define the roles of agencies dealing with international and national food safety standards, to streamline inspections at processing facilities and certifications.
12. **Promote alternative certification schemes for SSF processors.** Standard certification processes are technically demanding and expensive. Alternative schemes cognizant of the level of SSF operators should be sought and customized to the needs and levels of local processors. The standards should be high enough to conform to national standards, but practically attainable for SSF operators. This should not be seen as a lowering of standards, but rather as the application of alternatives, for example use of affordable equipment that still meets national standards.

5. Access to finance

Access to finance is a critical need among SSF actors across the entire value chain. Actors need capital for investment and working capital for fishing, landing, processing, distribution, value addition and marketing.

Yet, SSF actors face several deep-rooted challenges to accessing finance. The attractiveness of the sector to lenders is hampered by relatively low returns on investment, compared to other sectors. There is relatively low investment capacity and limited assets available that can be used as collateral. For women, social exclusion and access to credit are particularly exacerbated by the lack of assets that can be used as collateral to secure loans. Moreover, the weak institutional structure and organizational capacity in fishing communities contribute to a poor credit supply.

The geographical dispersion of coastal communities and the migratory nature of certain stakeholders also pose challenges to financial institutions, in terms of reach, high transaction costs of credit delivery, and repayment issues.

Poor political and regulatory frameworks result in weak regulatory and contract enforcements, sometimes making credit supply to fishing communities less attractive. Additionally, low literacy levels among SSFs actors and their vulnerability to risks (such as natural disasters) make the sector less attractive for microfinance and credit providers. These negative factors affect women more, and thereby diminish their access to credit.

The SSF Guidelines call on states to support the development of and access to appropriate services for small-scale fishing communities, for example savings, credit and insurance schemes, with special emphasis on ensuring women's access to such services. Furthermore, FAO was prompted to develop Guidelines for micro-finance and credit services (Grace and van Anrooy, 2019) geared towards helping SSF operators improve access to finance. Although the Guidelines for micro-finance and credit services focus on Asia, they can have global application. The Guidelines aim to:

- increase awareness of the financial service needs of small-scale actors, for more sustainable and inclusive access to finance;
- guide decision and policymakers in introducing and incentivizing financial services to SSFs and encouraging investment in the sector, while strengthening fisheries' sustainability and ecological and economic viability;
- build the capacity of financial service providers, fisherfolk organizations, NGOs and concerned government agencies to design and implement financial service products and programmes suitable to small-scale fishing communities and enhance social protection; and
- promote financial services that incentivize and reward responsible and sustainable fisheries.

5.1 EXAMPLES OF FINANCE MODELS

The review identified several positive examples of credit models for SSFs that could inform other initiatives. These are summarized below.

In Malawi, the Government has been establishing loan facilities to support different sectors of the economy under several initiatives, including the National Economic Empowerment Fund (NEEF) and the Agricultural Commercialization Programme (AgCOM). The AgCOM fund

requires only small amounts of collateral and runs a grant-matching facility whereby applicants provide 30 percent of the funds (10 percent in cash and 20 percent in-kind contribution), while the Government provides 70 percent. This grant need not be repaid. The matching grants for applicants are capped at USD 2 500 per producer household. A women's cooperative received a loan of USD 40 000, which it used to procure fish processing equipment. This type of finance through grants, in which beneficiaries also contribute, is an appropriate best practice, particularly because it is able to reach SSF operators – including women – who may be disadvantaged in terms of access to credit but who are able to provide in-kind contributions.

In another example from Malawi, FDH Bank Limited and NBS Bank joined forces with the Nsomba N'chuma project to provide loan facilities to fish processing businesses. The loans focused on supporting the adoption of improved fish processing technology. FDH Bank also provides training to processors on financial and business management skills before loan disbursement. Loanees submit a deposit of 20 percent of the requested amount that acts as collateral. Interest rates are 23.6 percent¹ per annum; however, female loanees are charged 2 percent lower than male beneficiaries to encourage their participation. Loanees can request for repayments to coincide with peak months of production, but repay in full within 12 months. This scheme enhances women's access to credit. The training component on financial and business management skills helps to improve the viability of businesses and the ability to repay loans. In Senegal, finance is provided by credit and savings societies as described in Box 3.

Box 3. An example of microfinancing scheme in the fisheries sector in Senegal

In Senegal, the Credit and Savings Society for the Development of Fishing [(Mutuelle d'Épargne et de Crédit pour la Promotion de la Pêche Artisanale Responsable de Cayar (MECPROPARG)) in Cayar and the Credit and Savings Society for the Promotion of Fishing in Mbour [(Mutuelle d'Épargne et de Crédit pour la Promotion de la Pêche Artisanale Responsable de Mbour (MECPROPEM))] are local financing facilities that target fisheries actors (fishers, fishmongers, processors), small-scale entrepreneurs and farmers to improve their businesses and livelihoods. Loans are typically used for the procurement of fishing boats, engines, fishing gear and equipment, and raw materials for fish processing. MECPROPARG was originally established in 2007 by the World Wide Fund for Nature (WWF) through a non-refundable grant of approximately USD 18 000, while MECPROPEM was established in 1999 with support from the Association pour une Dynamique de Progrès Économique et Social (ADPES) in partnership with the Fédération Nationale des Groupements d'Intérêt Économique de Pêche du Sénégal (FENAGIE Pêche), through a grant of approximately USD 28 000. Both MECPROPARG and MECPROPEM are currently run through funding from members' savings and loans received from other financing partners. MECPROPARG's fund value was approximately USD 1 million by 2020, with a customer base of 3 024 members, while that of MECPROPEM was approximately USD 500 000, with a customer base of 1 637 members.

MECPROPARG's interest rates for higher loan amounts is lower, at 12.84 percent, while for lower amounts, the interest rate is 14.88 percent. It has credit officers who follow up with loanees to ensure that loans are used for the intended purpose, remind loanees of repayment dates and assist in the recovery of outstanding payments. MECPROPARG's repayment rate is 88 percent, while that of MECPROPEM is 91 percent. However, delays in repayment have been occurring in the fishing sector due to a decline in fish catches. Both MECPROPARG and MECPROPEM attribute their success to good governance, having democratically elected management that operates transparently through bodies set up to provide guidance, direction and control. Some of their achievements include: increase in the savings culture to help during periods of decreased fish catches; increased proximity of access to financing; increased banking rates; and provision of support to educational, social and environmental programmes.

¹ Interest rates vary annually or within the year. The rates cited in this document only refer to the rates applicable while it was drafted.

Village banks and VSLAs are also an important source of financing in Malawi. Typically, the loan amounts range from USD 25 to USD 60. These loan amounts cannot meet the investment cost of improved fish processing technologies, and the interest rates for VSLA loans are also very high (20 percent per month). However, the advantage is that VSLA members benefit from the accrued interest at the end of the saving cycle. VSLAs make access to credit relatively easy, as there are few procedures and requirements and loanees are able to benefit from the interest calculated on their own savings. This makes VSLAs attractive to small-scale operators. In the United Republic of Tanzania, the Village Community Bank (VICOBA) is a popular form of microfinance (as described in Box 4).

Box 4. An example of village savings and loans schemes in the United Republic of Tanzania

In the United Republic of Tanzania, an important form of microfinance scheme is the Village Community Bank (VICOBA), modelled around the VSLA developed by the Social and Economic Development Initiatives of the United Republic of Tanzania (SEDI), the World Conference on Religion and Peace (WCRP) and CARE International in 2002. In coastal areas, VICOBA was started by the WWF, *Wanawake na Maendeleo* (WAMA) and the Aga Khan Foundation. Membership of VICOBA ranges between 25 and 30 persons, with 80 percent being women. The majority of the members are low-income earners and semi-illiterate women and men. The joining fee for a VICOBA ranges between USD 1 to USD 4, which is turned into a share. Typically, members hold between one and five shares. The amount loaned is usually equal to or lower than an applicant's savings, and normally ranges between USD 40 to USD 1 300, with a repayment period ranging between two to three months. The fund value for most VICOBAs ranges between USD 13 000 to USD 43 000. Most VICOBAs charge low interest rates of around 5 percent, given the erratic incomes in fisheries (compared to the range of 17 percent to 23 percent charged by conventional financial institutions). Interestingly, no interest is charged on education (school fees) and health loans (medical costs). VICOBAs also have weekly members' meetings to receive repayments, disburse loans and update records.

The VICOBA model reveals some good practices. For example, savings groups affiliated to a VICOBA form small collateral groups of five members, as a strategy to reduce loan defaulting by putting pressure on the applicant to repay the loan. As most of the fishers and fishworkers who form the majority of coastal VICOBA membership only have basic education, field agents from the WWF regularly conduct trainings for them. The scheme also includes a social fund that covers medical costs and school fees needs.

5.2 NORMATIVE GUIDANCE AND RECOMMENDATIONS ON ACCESS TO FINANCE

1. **Develop appropriate training programmes.** Microfinance facilities should include training programmes for loanees. These programmes should concern not only loan application processes and servicing, but also general financial and business management. The training should aim to improve business performance and hence ensure adequate cash flows to enable timely loan repayment.
2. **Establish mechanisms for loanee follow-ups.** The presence of credit officers to undertake frequent visits to loanees reduces loan defaults. Microfinance facilities with visiting credit officers helps to avoid diversion of loans from the core objectives for which they were applied, help to remind loanees of repayment dates and assist in the identification of training needs.

3. **Incorporation of collateral groups-** Financing facilities should incorporate collateral groups, in which members within groups provide group guarantees through their own shares and savings. Financing facilities with such models have low loan default levels, due to peer pressure on applicants to repay. Individuals organized in groups or cooperatives are also able to overcome the challenge of low loan amounts provided by consolidating their individual amounts to meet larger capital investment needs.
4. **Develop varied and appropriate financing instruments.** Financing facilities should develop varied products to adequately cover all types of needs, cognizant of the typical investments in their areas of operations, particularly those requiring heavy investments (such as for improved processing technology, that may cost over USD 1 000). Most facilities, especially village-based models, only provide small loans that are inadequate to meet large capital investment needs.
5. **Appreciation of risk inherent in SSFs.** Financial institutions perceive SSF stakeholders to be high-risk. Therefore, appreciation and accommodation of these risks in financial instruments is critical. Some measures that can be taken include: innovative product design; diversification of loan portfolios; and combination of alternative and complementary collateral with, where possible, credit guarantees that can be backed up by governments.
6. **Understanding of operators' needs and design of flexible products is critical.** SSFs are inherently marked by erratic cash flows and fluctuating yield yields. Therefore, financing needs to be nuanced to take account of specific fisheries' needs and value chain nodes. No fishery is like another. Thus, loan products lacking this understanding risk higher rates of default. This calls for in-depth research by private and government-backed financial institutions to understand these differentiated dynamics and financial needs. Flexibility to seasonal volatility should therefore also be part of the design. Such techniques may include but is not limited to: adaptation of loan terms to seasonal dynamics; disbursement of funds based on seasonal peaks; and building of repayment plans in sync with diverse profiles and needs.
7. **Design appropriate education and marketing promotional material.** Illiteracy among SSF operators is generally high. Therefore, the educational and marketing promotional material should reflect these realities. This will help demystify financing schemes and gain trust from the targeted beneficiaries.

6. Conclusions

Lessons from successful post-harvest fisheries interventions will inform the design and implementation of future initiatives. The SSF Guidelines include general policy guidance related to post-harvest fisheries development with specific regard to processing, trade, the role of women, and service provision. Using the available secondary data and field investigations targeted at potentially successful interventions and initiatives, this review has crystallized specific guidance that seeks to support infrastructure, technology, value addition and the financial services provision for SSFs, in the context of the SSF Guidelines. It aims to promote a multidisciplinary, more holistic, value chain approach to SSF development.

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