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GENDER AND FOOD LOSS IN SUSTAINABLE FISH VALUE CHAINS IN AFRICA



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A woman puts fresh sprat to sun dry in a drying area next to the shore of Lake Tanganyika in Kigoma, United Republic of Tanzania.
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ABBREVIATIONS AND ACRONYMS

CLP	critical loss point
FAO	Food and Agriculture Organization of the United Nations
SSF Guidelines	Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication

EXECUTIVE SUMMARY

World fisheries and aquaculture supply has experienced tremendous growth and is estimated to reach over 200 million tonnes by 2030. Globally, fish accounts for about 17 percent of animal protein intake and the apparent per capita fish consumption is currently more than 20 kg. About 200 million people are employed in the fisheries and aquaculture sector worldwide in both the primary and secondary levels – the majority within developing countries and including a large number of women employed mostly in processing activities. Food loss and waste occur in most, if not all, fisheries supply chains. Losses constitute lost income to fishers, processors and traders but they also contribute to food insecurity because a loss of any fish means less fish available for the consumer. In addition, food loss significantly contributes to the increasing environmental cost of food production. For these reasons, reduction of this loss and waste is becoming increasingly more important.

Although progress has been made in identifying the direct causes of fish losses and quantifying the magnitude of the loss, loss reduction strategies have in the past tended to focus on technological solutions and hence have overlooked the relevance of socio-economic factors that influence the functioning of the fisheries value chain. Gender relations are a primary factor in the social and economic context that shapes the functioning of fisheries value chains at all levels and influence the division of labour, gender roles and responsibilities and create disparities in access to and control over resources, services, knowledge and technologies. Consequently, gender relations impact the food value chain's overall efficiency and food losses (FAO, 2018). In addition, gender relations exist between the different fisheries actors and services, such as fisheries extension, finance, quality control, management of conservation provisions and ice plants. Very often, these services have limited or non-existent gender-sensitivity considerations. In fact, it is these same gender relations that influence the capacity of actors to reduce losses and waste.

In 2018, FAO published the *Gender and food loss in sustainable food value chains – A guiding note* (FAO, 2018) with the aim of conceptualizing and raising awareness on the nexus between gender and food loss while offering practical guidance on and tools for integrating gender concerns into food loss studies and the planning and implementation of reduction strategies and interventions. This paper interprets key elements of the FAO Guiding Note in the context of African small-scale fisheries and incorporates the concepts developed in *Towards gender-equitable small-scale fisheries governance and development – A handbook. In support of the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication* (FAO, 2017b). The aim of the paper is to provide background on key issues in order to encourage critical reflection and dialogue amongst researchers, policymakers, development practitioners and other stakeholders in the design and implementation of fish loss studies and interventions, to systematically and more effectively integrate gender equality concerns into their work. In the fisheries sector in particular, both quality and physical losses are aggravated by unequal power relations, unequal distribution of resources and rights between women and men along the value

chain. By providing guidance on how to integrate gender concerns into food loss interventions within fish value chains, this paper aims to help address the existing knowledge gaps and contribute to the development of an approach which is tailored to fish value chains and ultimately to support sustainable small-scale fisheries and aquaculture for food security and nutrition. A key next step would be the application of this approach to facilitate gender-sensitive food loss solutions.

1. INTRODUCTION

Food loss and waste occurs in most, if not all, value chains. In the past decade, food loss and waste has received significant attention as a critical contributor to inefficient food systems at both global and regional levels. FAO defines food loss as the decrease in quantity or quality of food along the food supply chain (from production through to the point of retail sale). It estimates that approximately one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tonnes per year (HLPE, 2014). In terms of fish loss this affects fisheries and aquaculture products intended for human consumption. A reduction in fish quality usually implies a reduction in nutritional value, economic value, or even food safety. Loss of quality or quantity equates to loss of income to fishers, processors and traders, as well as contributing to food insecurity.

Reduction of food loss is a priority, which results in improved food security, nutrition, and sustainability of food systems. This has been recognized by the 2030 Agenda for Sustainable Development, which sets a global target for food loss reduction: Target 12.3, “By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses”, and under Sustainable Development Goal 12, “Ensure sustainable consumption and production patterns” (FAO, 2018). The FAO Code of Conduct for Responsible Fisheries encourages responsible fish utilization, including the reduction of post-harvest losses and waste. Furthermore, the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (SSF Guidelines) emphasize the importance of avoiding post-harvest losses and waste. The Guidelines encourage environmentally sustainable practices within an ecosystem approach, deterring, for example, waste of inputs (water, fuelwood, etc.) in small-scale fish handling and processing (see SSF guidelines Chapter 7, paragraph 5). At the continental level, the African Union has developed an Implementation Strategy and Roadmap based upon the Malabo Declaration, with strategic actions and milestones for the period 2015 to 2025. Malabo Strategic Action Area 1 targets “Support to post-harvest management”, with the aim of establishing effective post-harvest loss reduction systems on the continent by 2025.

Gender is one of the many dimensions or variables associated with the occurrence, type, level and means of coping with food loss in fish value chains. However, it is one of the less well studied and understood issues. This could be because fish loss has been seen as the domain of technologists and fisheries specialists as opposed to value chain experts, social and gender specialists, and further reflects a historical problem of gender blindness. It could also be related to the fact that the importance of considering gender has only been recognized recently. In addition, the unpaid labour of women for essential pre/post-harvest tasks, which are usually performed within or close to the home, can be viewed as housework because these tasks are performed as part of women’s unpaid responsibilities. Consequently, women can remain invisible value chain actors.

In 2018, FAO published the *Gender and food loss in sustainable food value chains – A Guiding Note* with the aim of conceptualizing and raising awareness of the linkage or relationship between gender and food loss. The Guiding Note provides practical assistance on, and tools for, integration of gender concerns into food loss studies and the planning and implementation of reduction strategies and interventions.

This paper interprets key elements of the Guiding Note, with the aim to adapt it to the African small-scale fisheries context. It also considers the concepts developed in *Towards gender-equitable small-scale fisheries governance and development – A handbook. In support of the implementation of the Voluntary Guidelines for Securing Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication* (FAO, 2017b). The aim is to provide guidance to researchers, policymakers, development practitioners and other potential users, in the design and implementation of fish loss studies and the identification of gender-sensitive solutions. It supports a more systematic and effective integration of gender equality concerns into loss reduction work. The paper is divided into two main parts: an overview of food loss and gender in fish value chains; and a summary of the Guiding Note approach in the context of fish value chains. It is anticipated that the paper will be a stepping stone to practical work in fish value chains in order to introduce gender solutions to fish loss.

2. MAIN CAUSES OF FOOD LOSS IN FISH VALUE CHAINS

Food loss impacts are not only an issue pertinent to food security and nutrition, but also require the agriculture and fisheries sector to produce additional food to compensate. This extra burden has economic and environmental costs globally. The economic value of food loss is roughly USD 940 billion per year (Lipinski and O'Connor, 2016) and accounts for 8 percent of global greenhouse gas emissions annually (FAO, 2015a). By reducing food loss, the quantity of food available increases; pressure on ecosystems, climate, and water is reduced; and poverty is alleviated.

Post-harvest losses occur at all stages in the fish value chain, from capture to consumer. For industrialized regions (Europe, North America, Oceania and industrialized Asia), losses in primary fish and seafood production are significant and are due to the discarding of fish at sea, which is estimated to be between 9 percent and 15 percent of marine catches. Consumer households also waste a large proportion of purchased fish and seafood. However, in developing countries, losses in primary production mostly include the discarding of between 6 percent and 8 percent of marine catches and losses in small-scale fisheries during processing, distribution and marketing, mainly due to quality deterioration. These losses vary according to such things as location, species of fish, type of processing method and handling practices (Kruijssen *et al.*, 2020).

In African small-scale fisheries both quantitative and qualitative losses of more than 70 percent of total losses are reported to occur in many of the supply chains and in many countries, with the quality losses due to poor handling practices as well as a lack of adequate processing and packaging technologies (Diei-Ouadi & Akande, 2010).

However, food loss remains a multidimensional and complex issue and addressing it depends on the specific conditions and local situation in any given country or region. Generally, it results from infrastructural inadequacies and capacity limitations of actors along the food value chain, which in turn are the result of specific socio-cultural, institutional, and economic contexts where the value chain actors operate (FAO, 2018).

A fundamental cause of food losses are the inefficiencies of the value chain (FAO, 2018). In the fish value chain, these inefficiencies can be grouped according to issues related to: (i) policy; (ii) technology; (iii) skills and knowledge; (iv) services and infrastructure; (v) regulatory environment; (vi) social and gender equity; and (vii) markets.

The lack or inexistence of technology (from the cold chain to processing, storage and packaging) is a key cause of losses related to quality deterioration, especially in developing countries. Skills and knowledge concern both small-scale fishing communities and consumers. The fishing communities must be aware of good handling, processing, packaging and storage practices, business management and efficient marketing. As for the consumers, they are encouraged to demand safe and good quality food. Consumers are also taught to accept *ugly food* i.e. products that are nutritionally beneficial, but which may be visually different in order to avoid waste at the retail level. The existence and access to

services (including certification, quality control, extension, information and financial services) and infrastructure, enable fishers, processors and traders to leverage the skills and knowledge needed to move their products efficiently and effectively, from upstream to the consumer.

Another cause of loss is the regulatory environment: the laws, rules and regulations put in place by government entities and civilian organizations to control the behaviour and actions of value chain stakeholders. The effective implementation of legislation is an important challenge. For example, in many African countries, good and modern legislation may be in place on paper, but a lack of enforcement and implementation often reduces its effectiveness.

Access to markets and market dynamics can also be a root cause of food loss. Poor market access ultimately leads to spoilage of fish before it is sold. Oversupply usually leads to a negative price effect for the fish processors and traders and can lead to fish quality deterioration.

Finally, social and gender constraints and gender inequalities with associated implications for wealth, poverty, cultural and social norms and attitudes, all influence food loss. The issue of gender is the focus of this paper and is discussed in more detail in the following section.

Table 1 summarizes the direct causes of food loss in the small-scale fishery value chains in Africa. However, as mentioned, there are also underlying reasons for these direct causes that might be linked to: the economic system; the institutional setting; policy and legal frameworks; and the socio-cultural and gender context (FAO, 2018).

► **TABLE 1**

Main causes of food loss in the fish value chain

MACRO-CATEGORIES	CAUSES OF LOSSES
Policy	Fisheries management decisions leading to discarding of fish at sea Weak implementation of policy designed to reduce fish loss and waste
Regulatory environment	Standards which promote good handling and hygiene not applied Lack of proper regulations for labelling Labelling causing confusion among consumers
Technology	Small-scale fishers often use small and unpainted canoes. Such boats are usually not compartmentalized which makes the handling of goods and the use of ice on-board difficult Use of destructive and harmful methods of fishing Predation of fish caught in gear by other fish and animals Inefficient or absence of a cold chain Use of inadequate transport technology (bicycles, taxis instead of refrigerated vehicles) Inefficient processing methods and/or technologies Processing of already poor-quality fish Breakage or damage due to inadequate packaging methods and materials Inadequate storage facilities and practices
Skills and knowledge	Poor understanding of good handling and hygiene practice Illiteracy of traders makes the application of regulations, norms and certification difficult Limited access of fishers, processors and traders to effective extension services

(Cont.)

MACRO-CATEGORIES	CAUSES OF LOSSES
Services and infrastructure	<p>Poor road infrastructure makes fresh distribution difficult and leads to spoilage</p> <p>Delays due to breakdown of vehicles from landing to processing sites and/or market</p> <p>Landing sites in remote areas lack potable water, shelter, electricity, sanitary facilities and other necessities like ice which leads to poor fish handling, hygiene and spoilage</p> <p>Poor access to credit facilities makes investment in improved technology and the development of small and medium enterprises difficult</p> <p>fish traders and/or transporters allow items and travellers to sit on the fish, which further increases the risk of damage and contamination</p>
Social and gender constraints and inequalities	<p>Theft at the landing site</p> <p>Drying fish unsupervised on the ground leads to contamination with unsanitized surfaces, sand and insect infestations</p> <p>Fish is left unsupervised for drying, because women are doing household chores (domestic and care tasks) at the same time</p> <p>Landing site services and access to services favour men, especially where access conflicts with use by women</p>
Markets	<p>Species with low market value. For example, in Burkina Faso, species with low market value like <i>Heterotis</i> are widely available but not valued by consumers</p> <p>Consumer habits, for example, in throwing away edible parts of the fish</p> <p>Rejection of products which do not meet standards</p> <p>No access to or lack of marketing information, especially when coupled with market oversupply</p> <p>Delays in selling. Cultural practices may cause delays in buying and selling</p>

Sources: FAO. 2021. *Food loss and waste in fish value chains*. Rome. [fao.org/flw-in-fish-value-chains/overview/food-loss-and-waste-in-fish-value-chains/en](https://www.fao.org/flw-in-fish-value-chains/overview/food-loss-and-waste-in-fish-value-chains/en); Diei-Ouadi, Y. & Mgawe, Y.I. 2011. *Post-harvest fish loss assessment in small-scale fisheries: A guide for the extension officer*. FAO Fisheries and Aquaculture Technical Paper No. 559. Rome, FAO. [fao.org/3/i2241e/i2241e.pdf](https://www.fao.org/3/i2241e/i2241e.pdf)

3. GENDER AND FOOD LOSS IN FISH VALUE CHAINS

The different predetermined social and production roles of men and women affect access to and control over assets, knowledge, services, as well as participation in productive activities and decision-making. In the African fisheries and aquaculture sector, women make up more than one-fourth of the workforce (de Graaf and Garibaldi, 2014). In small-scale fisheries, "the gender division of labour is based on the predominant perception of women as caregivers, associated with their tasks in the domestic or private sphere, and men as wage earners, associated with the external world or public sphere" (FAO, 2017b, p.4). By virtue of this perception, fishing is usually performed by men, and women primarily undertake post-harvest activities such as processing and trade. Women's fisheries-related work is traditionally considered an extension of domestic work, with most of the tasks carried out at home or not far from home. This is one reason why women's roles are undervalued economically and generally overlooked in official labour data collection, because these roles are usually unpaid. The generally accepted norms regarding mobility of women and time constraints due to household and care activities are other important factors to consider. However, in some countries, women are also involved in fishing, predominantly in small-scale fisheries, through boat ownership, as sponsors of fishing trips, and through funding of inputs such as fishing gears, boats, fuel and food for crew members.

As such, regardless their involvement at either the stage of fishing or post-harvest, women are essential users of fisheries resources and pivotal players in the value chain. Women also play a role as agents, creating linkages between the fishers and the consumer. They are impacted by and also impact what happens upstream and at the market level. Therefore their actions may determine whether or not food loss occurs and to what extent it occurs. As the first purchaser of the fish from the fishers, and as an investor in fishing activities, women are in a position to influence fishers' behaviour in terms of how fish is handled and in the use of bycatch. Where women lack influence over the fishers' behaviour, it may mean that women have little say in terms of the quality of the fish they may purchase and are therefore price takers rather than makers – bearing in mind that purchasing poor quality fish increases the risk of loss further down the value chain. Women may also influence consumers' habits, for example by demanding better quality products in the market. However, compared to men, women still have limited access to resources and services and their labour fetches lower financial returns. Women also tend to have a lower degree of organization and are usually marginalized from fisheries decision-making roles, be it in management or in fisheries unions and associations. The failure to recognize the multiple roles performed by women along the fish value chain, as well as the unpaid (or underpaid) nature of their labour and the constraints experienced in accessing services and markets, often prevent women from fully realizing their potential in addressing food loss prevention and reduction.

According to the FAO Guiding Note on *Gender and food loss in sustainable food value chains*, the link between the level of food loss and gender equality is the the food loss and gender nexus (FAO, 2018). The combination of productive activities with household and care tasks required of women creates time and energy constraints and significantly increases the levels of losses. For example, women processors may accidentally burn the fish during the smoking operation, as they concomitantly carry out household duties. Predation by animals, infestation by insects, and theft also lead to losses because the fish is left unattended during processing (Cole *et al.*, 2018).

In some communities, women are restricted from traveling long distances due to their domestic responsibilities and restrictive social norms (fear from husbands about possible encounters with other men and staying a night out of the home) and perceived risks of gender-based violence. These limitations prevent women from accessing fresher and better-quality fish that may be found in more distant markets and landing sites. The same limitations on mobility also affect their access to other markets, even those nearby, and limits the ability of women to obtain optimum prices. With regards to mobility limitations, women may not only be restricted from travelling longer distances, but also by their access to transport. In some countries, women are not allowed to ride motorcycles, or men are the drivers and owners of bikes and motorcycles. Also, women may not be able to travel after dark, so they cannot participate in night markets or travel in the early mornings to landing sites.

Differences in men's and women's knowledge is another relevant factor, for example, in the uptake of technological solutions aimed at reducing losses. In many African small-scale fishing communities, women's illiteracy rate is generally higher than men's, posing a challenge to the grasp of technology by low-skilled and low-literate women. At the same time, acquiring the skills and access to training provided by extension workers can be limited (**Box 1**) and elite capture may favour rich women and men over poorer women and men. Women's unpaid labour in pre/post-harvest tasks, which is usually performed within or close to the home, tends to acquire similar characteristics to housework, which causes women to be ignored by extension services. In addition, extension workers are often men, and in some cultures, norms do not allow women to interact with men who are not their husbands or families. All this limits women's ability to learn and acquire better practices and extend their resource networks, which could contribute to the control and reduction of food loss.

Further to the above, limited access to financial services remains a major obstacle to accessing improved facilities and/or technologies that would assist in the reduction of food loss. Although this is generally a common issue for both men and women in small-scale fisheries, women are typically more marginalized due to their lack of collateral.

► **BOX 1**

Post-harvest fish losses and gender inequality in the Barotse Floodplain, Zambia

In the Barotse Floodplain in Zambia, where there are high rates of poverty and hunger, fishing is an important source of food and income. Nevertheless, around one-third of the region's total fish catch is lost every year. These fish losses affect female and male fishers, processors and traders in different ways, with women processors experiencing higher post-harvest fish losses and achieving lower returns on their financial investments than men.

In the traditional socio-cultural context, Zambian men are expected to be responsible for fishing because people believe that women lack the physical skills needed to fish. Meanwhile, women represent 60 percent of the people involved in fish processing, which is the stage in the value chain in which most of the fish is lost. Of the one-third of fish lost during processing, most (70 percent) is a result of the degradation in the quality of the fish, causing traders to offload fish products at lower prices. This results in lost revenue for the woman-dominated processing sector, which already has the lowest gross margins (2.6 percent to 5.5 percent) compared to fishing (21.5 percent) and trading (12.2 percent to 13.8 percent). However, even compared to male processors, women lose far more fish and subsequently, have lower gross margins (2.6 percent compared with 5.5 percent for men). This is partly because women have less access to government extension services and training, which implies that their technical and business skills are often lower than those of men. Also, women either do not individually own important assets for fishing or, unlike men must transport the fish to the market and therefore have less time available to process fish due to unpaid household responsibilities.

Source: FAO & CARE. 2019. Good practices for integrating gender equality and women's empowerment in climate-smart agriculture programmes. Atlanta. fao.org/3/ca3883en/ca3883en.pdf.

This short overview demonstrates the important role that women play in the sector and the immense potential women bring, despite the restrictions that gender can play therein. What we can see is that unbalanced gender relations – due to societal norms, attitudes and behaviours that perpetuate gender inequalities – are rooted in discriminatory social, economic, formal and informal institutions, policies and laws, and result in the various constraints faced by women in accessing and controlling the resources needed to carry out their activities effectively. The knock-on effect is often inefficiency, leading to food loss in fish value chains.

4. ANALYSING FISH LOSS THROUGH A GENDER LENS

A gender-sensitive food loss value chain analysis highlights the dynamics and factors that influence women's and men's natural social disposition and participation in fisheries activities according to dominant assigned gender roles. Gender roles correspond with behaviour, tasks and responsibilities that a society considers appropriate for men and women and represent a basis for the distribution of work, resources and rights. The remainder of this paper provides an understanding of the key components of such an analysis, which consists of three main steps:

Step 1. Gender-sensitive mapping of the fish value chain to identify the actors involved, their linkages and estimated percentages of men and women – including youth – involved in each node of the chain.

Step 2. Identification of the constraints that affect women's and men's participation in the fish value chain including constraints due to gender-based discrimination, especially those linked to food loss.

Step 3. Development of gender-sensitive fish loss reduction interventions, taking into consideration the underlying socio-cultural and gender context of the fish value chain.

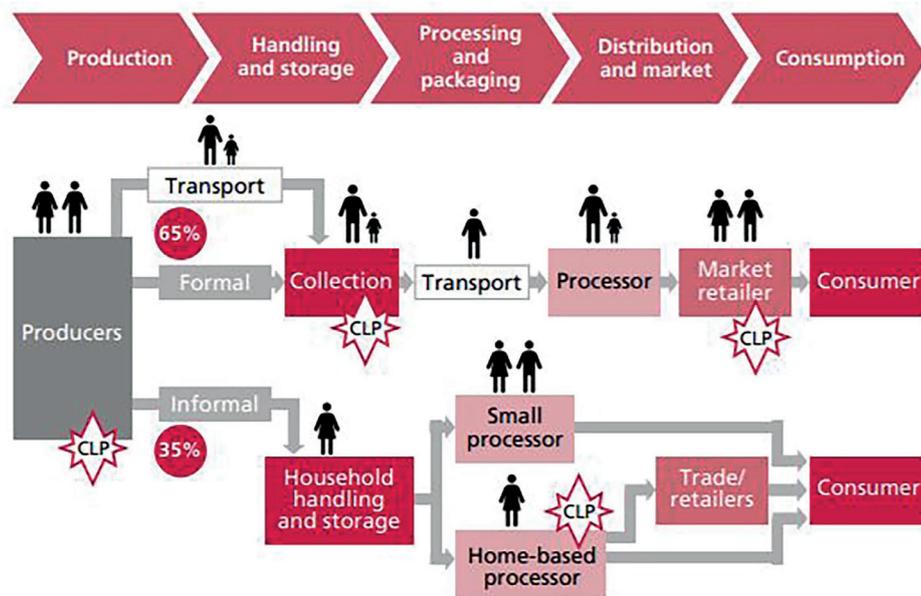
For efficiency, especially when the scope of a study is vast and study resources are limited, a gender-sensitive food loss value chain analysis might focus on critical loss points (CLP) in the value chain as opposed to the whole value chain (FAO, 2018). These CLPs occur where losses have the highest magnitude, the highest impact on food security and the largest impact effect on the economic outcomes (FAO, 2016a). The three main steps are described in more detail below.

Step 1. Gender-sensitive mapping of fish loss

A gender-sensitive mapping of food loss provides a visual representation (usually in the form of a flowchart) of the food value chain, including information on actors, farms, firms, value-adding activities and vertical and horizontal linkages along the nodes (FAO, 2016a). It illustrates women's and men's varying participation, position and contribution to value chain activities ([Figure 1](#)). Data are age and sex-disaggregated and activities are flagged as male or female dominated. The mapping also highlights: the CLP; which actors are experiencing the most significant losses; and who in the end pays for these losses. CLP may also be established from a separate or parallel food loss assessment process using different methods (FAO, 2018; Diei-Ouadi and Mgawe, 2011; Ward, 2000). The participatory survey form presented in Annex 1 is a guide for the data collection process. The data is generated from interviews with key informants and focus group discussions. A flow diagram exercise is a useful tool to help map the value chain and understand gender perspectives.

Participatory methods such as semi-structured interviews allow value chain actors to identify the main constraints they face, potential solutions and the utilization of the most appropriate solutions.

► **FIGURE 1**
Example of a flow diagram for gender-sensitive value chain mapping



Note: The figure symbols and size indicate the quantitative presence of women and men in the different nodes of the value chain. When both are involved, the bigger symbol indicates the sex of the group that is the main actor at the particular step.
 Source: FAO. 2018. *Gender and food loss in sustainable food value chains – A guiding note*. Rome, FAO. www.fao.org/documents/card/en/c/I8620EN

In addition to the visual representation, mapping involves the development of a gender-sensitive analysis matrix. This presents data gleaned from interviews that give a greater depth of understanding, particularly on the roles and responsibilities of value chain actors, relations between value chain actors, how their work impacts the other nodes of the value chain and their specific conditions, including the socio-cultural context in which they operate. The matrix below (Table 2) shows how data can be presented according to value chain activities. Rows are added to include all possible activities under each value chain node. The circumstances within which women and men engage in each node are evaluated and scored by looking at access to and control over: productive resources; advisory services and training; infrastructure; and knowledge and information. The scores range from 1 to 4, where: 1 is bad/very constraining; 2 is moderately good/moderately constraining; 3 is good/enabling; and 4 is excellent/highly enabling.

► **TABLE 2**
Example of a gender-sensitive analysis matrix

VALUE CHAIN NODES - CLP	DESCRIPTION OF ACTIVITIES	DESCRIPTION AND ESTIMATE OF FISH LOSSES	WHO IS MAINLY INVOLVED: WOMEN OR MEN	INVOLVEMENT OF WOMEN (SCORE)		INVOLVEMENT OF MEN (SCORE)		ORGANIZATIONAL/ INSTITUTIONAL SETTING (INDIVIDUAL/ HOUSEHOLD LEVEL/ COOPERATIVE/ FIRMS)	CHALLENGES FOR THE ACTORS AND REMARKS ON THE SCORES
				WOMEN	GIRLS	MEN	BOYS		
Pre-fishing	Mending nets	-	Women	2	-	-	-	Individual	Limited knowledge on the appropriate types of nets to use
Fishing	Fishing	30%	Men	-	-	2	-	Individual	Limited fishing gears
Processing	Smoking	30%	Women	1	-	-	--	Cooperative	Inefficient smoking technology (use of traditional smoking oven)

Descriptive case studies are also important ways of presenting data from the mapping interview process. **Box 2** is an example of a case study from the dried fish value chain in Sierra Leone. It highlights the constraints the actors face and describes the link between constraints and food loss.

► **BOX 2**

The dried fish value chain in Sierra Leone

In the traditional dried fish value chain in Sierra Leone and other West African countries, women's and men's functions are clearly separated. Coastal or lake fishing is exclusively carried out by men, who also take care of the boats and the fishing gear. Fish processing and trade are entirely carried out by women. Fishermen sell the fresh catch to the village women, who then smoke or dry the fish and engage in selling and trading. In some cases, the fishermen also sell to their own wives, establishing an intra-household business relationship. Women who take care of children, also involve the youth in the processing tasks. This example of a gendered division of labour is based on a long-standing traditional pattern, which shows how important a gender-sensitive value chain mapping is in order to understand which actors are experiencing losses in a specific node of the value chain (e.g. production or processing) and why.

Source: FAO, 2018. *Gender and food loss in sustainable food value chains – A guiding note*. Rome, FAO.

fao.org/documents/card/en/c/l8620EN.

Step 2. Identification of gender-based constraints linked to fish loss

The gender-sensitive analysis matrix serves as a basis for identifying the main gender-based constraints linked to food loss (**Table 3**). Once the CLPs are identified and it is known which actors experience the losses, the next step is to collect data in order to understand why the losses occur, including if necessary, another round of interviews. The focus of this stage of the study is to address gender-based constraints faced by the value chain actors, as the underlying reasons for fish value chain inefficiencies. Gender-based constraints can be defined as restrictions on men's or women's access to resources or opportunities that are based on their gender roles or responsibilities, as detailed by USAID (USAID, 2009). In gender-sensitive analysis studies, the inequalities that lead to gender-based constraints can be grouped into two groups: access to productive resources (assets, agricultural services and financial services) and power and agency (control over resources and profits); and the ability to make autonomous decisions on their use (FAO, 2018). Main categories of gender-based constraints influencing food losses in multiple value chain levels might include, but are not limited to: (i) limited access to knowledge and information; (ii) limited participation in organizations and in decision-making processes; (iii) limited access to finance; (iv) limited access to inputs and resources; (v) work burden and time poverty (FAO, 2018).

▶ TABLE 3
Identifying gender-based constraints from the gender-sensitive analysis table

VALUE CHAIN NODES - CLP	DESCRIPTION OF ACTIVITIES	DESCRIPTION AND ESTIMATE OF FISH LOSSES	WHO IS MAINLY INVOLVED: WOMEN OR MEN	INVOLVEMENT OF WOMEN (SCORE)	WOMEN GIRLS	INVOLVEMENT OF MEN (SCORE)	MEN BOYS	ORGANIZATIONAL/ INSTITUTIONAL SETTING (INDIVIDUAL/ HOUSEHOLD LEVEL/ COOPERATIVE/ FIRMS)	CHALLENGES FOR THE ACTORS AND REMARKS ON THE SCORES	CONSEQUENCES ON THE EFFICIENCY AND PERFORMANCE OF THE VALUE CHAIN AND LOSS	GENDER-BASED CONSTRAINTS
Processing	Smoking	30%	Women	1	-	-	-	Cooperatives	Inefficient smoking technology (use of traditional smoking oven)	Poor processing equipment Low product quality High level of losses No access to remunerative markets	Limited access to knowledge and information, such as food safety and quality standards, market and price information. Limited access to finance to invest on improved technology Limited access to inputs and resources as extension services

The table below is an example of how gender-based constraints can be presented in a gender-sensitive analysis matrix using two additional columns.

► BOX 3

Accessing markets using mobile phones

Omena (*Rastrineobola argentea*) is a small fish that is the mainstay of the local economy of certain villages around Lake Victoria in Kenya. However, women must dry and sell the fish within six hours, after which time the fish loses its value. Brokers who buy the fish collude to keep prices low. The Kenya Marine and Fisheries Research Institute has set up a fish market information network that women can access through their mobile phones. The data has helped women bargain better and improved income by around 20 percent.

Source: FAO & CARE. 2019. *Good practices for integrating gender equality and women's empowerment in climate-smart agriculture programmes*. Rome, FAO and CARE, Atlanta, USA. fao.org/3/ca3883en/ca3883en.pdf

Understanding what the main gender-based constraints are will help formulate solutions for food loss reduction, as shown in the example in **Box 3**.

The approach considers five levels of analysis:

- 1_ the core value chain which includes the fishing communities (fishers, processors, traders), and the coordinated value-adding activities (fishing, processing, packaging and marketing);
- 2_ the extended value chain which includes business development support providers who facilitate the value creation process by providing physical inputs (baits, packaging materials), non-financial services (transport, market research) and financial services (loans);
- 3_ the national and global enabling environments which include the legal frameworks, policies, standards (regulations on markets and exports);
- 4_ the household; and
- 5_ the individual levels of analysis, which develops an understanding of the different functions, responsibilities and rights of men and women in the nodes of the chain.

Socio-cultural norms and traditions are embedded in all levels of analysis. If discriminatory practices and attitudes are established at the household level, they are probably reflected in the division of economic and social activities. Table B in Annex 3 provides a summary of the analysis on how to conduct the five levels of analysis. It builds on the information collected for Step 1 (gender-sensitive mapping of fish loss) regarding the challenges women and men face and describes the consequences for the performance of the chain and on food losses.

Step 3. Design of gender-sensitive fish loss reduction solutions

Sustainable food loss reduction solutions should consider the underlying socio-cultural and gender dimensions of a fish value chain. Entry points for gender-related food loss reduction solutions will address gender-based constraints identified in Step 2. As mentioned above, gender-based constraints can cut across multiple nodes and simultaneously be found at the five different levels of the fish value chain (the core value chain, the extended value chain, the national and global enabling

environments, the household, and the individual levels). **Figure 2** provides examples of entry points for the design of gender-sensitive fish loss reduction solutions.

TABLE 4

Examples of concrete entry points to address gender-based constraints and food loss at all levels of the value chain

INDIVIDUAL AND HOUSEHOLD LEVEL	
Equal decision-making power in the household	Through communication and awareness raising activities, engage with men and women to reflect on intra-household dynamics that cause gender inequalities and ultimately lead to food loss. For example, this implies an equitable household chores division between the spouses that allows women to have more time to look after their processing activities. As such, increase women's and men's decision-making capabilities on how to use their time and how to allocate income (investing in improved technologies, attending training, etc.) to reduce food loss.
Work burden and time poverty	Create and disseminate gender-sensitive and labour-saving technologies that improve labour-intensive activities and reduce fish loss, such as improved fish processing technologies.
Limited mobility	Overcome cultural barriers through communication and education to allow women to access markets even when located far from home.
Access to information, knowledge and training	Increase access to knowledge and information on post-harvest good practices (fish handling, fish processing, storage and packaging) to mitigate loss due to spoilage through training and awareness raising activities. Raise awareness to strengthen the demand for extension services.
CORE AND EXTENDED VALUE CHAIN LEVEL/SERVICE PROVISION	
Equal participation and leadership in fisheries organizations	Support the equal and effective participation of women and men in fisheries organizations to provide them with access to facilities, services and improved technology and establish mechanisms to enhance women's participation in decision-making bodies at the local and national levels. Literacy programmes which are followed by leadership and self-development training and information access programmes are often key. There may also be scope for the review of membership requirements to facilitate and increase women's involvement and decision-making positions.
Gender-sensitive tools and technology	Develop skills and improve access to appropriate and women-friendly tools and technologies to reduce fish loss (from adequate fishing gears to cold chain facilities and improved fish processing technology). Nevertheless, technology on its own is not a guarantee of the reduction of food loss and waste. It has to be adopted and maintained in good condition, used properly and be fit for purpose, and often requires knowledge and skills for it to be used effectively.

(Cont.)

Access to financial services and products	<p>Strengthen fisheries organizations and value chain actors' equal access to finance. Improving access to financial services supports investment in improved technology and product development/value-add and hence reducing loss and waste.</p> <p>Promote innovative collateral accessible for women who often have fewer property assets such as land.</p> <p>Strengthen capacities of service providers to develop financial products suitable for women.</p> <p>Improve registries and control of expenses at the actors' level to enhance their identity and contribution to the value chain.</p>
Access to information, knowledge and training	<p>Provide women and men with equal access to training, information and knowledge about improved post-harvest practices and markets. When doing so, always consider the prevailing cultural norms in the fishing community. For instance, there might be a need to hire a female training provider or extension officer to work with women only. Identify appropriate schedules for women participating in meetings and trainings; develop service provider capacities to deliver gender-sensitive services</p>

NATIONAL AND GLOBAL ENABLING ENVIRONMENT LEVEL

Social norms and institutional settings (policy and laws)	<p>Enhance women's role as entrepreneurs, strengthen their self-confidence and increase their decision-making power. Promote role models of successful women entrepreneurs to strengthen the perception of women as economic actors. At the national level, these interventions should be promoted through adhering to policy, for instance, guidance provided by the FAO SSF Guidelines (FAO, 2015b).</p>
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Source: FAO. 2018. *Gender and food loss in sustainable food value chains - A guiding note*. Rome, FAO. fao.org/documents/card/en/c/18620EN

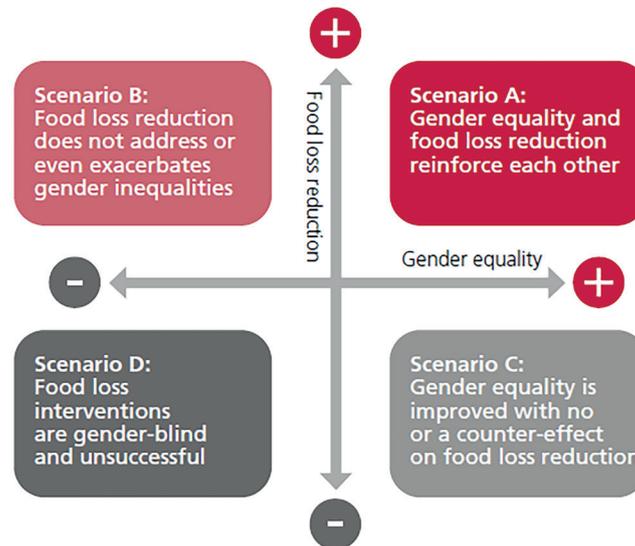
From the outset, in order to address gender-based constraints, policymakers, development officers and local stakeholders must start identifying and planning practical implementable solutions to both reduce food loss and foster gender equality with an aim to achieve Scenario A in **Figure 3**. The four scenarios suggested in **Figure 2** will help decision makers contemplate the potential outcomes of proposed solutions and avoid negative scenarios.

These four scenarios (A, B, C and D) suggest that some food loss reduction interventions can have unexpected consequences and may be unsuccessful and even exacerbate gender inequalities in the fish value chain. In order to lower such risks, interventions should be assessed in terms of the socio-cultural and economic consequences of their implementation (See **Box 4**). Undertaking this assessment through data collection and possibly another round of interviews with influential fish value chain stakeholders, with poor and vulnerable fish value chain actors and with service providers, should highlight the differential actions to be taken to make everyone benefit from a scenario A or C in **Figure 3**. It is important to analyse elite capture and to take into account that women are not a homogenous group. Women who own capital and invest in their value chain activity will have more interest in promoting a scenario that favours improved interactions with financial institutions; poor women who are working on a very limited revolving fund will not have the capacity to invest and will favour interventions that strengthen women's cooperatives. Another aspect to consider in this assessment study is, the role of the financial burden of post-harvest losses – who pays and whether there is a need to change/influence the relationships.

Annex 4 provides a perspective of the process which can be used to help understand and predict possible impacts of interventions.

► FIGURE 2

Four scenarios of potential outcomes of food loss reduction and gender equality solutions



Source: FAO. 2018. *Gender and food loss in sustainable food value chains – A guiding note*. Rome, FAO. fao.org/documents/card/en/c/18620EN

► BOX 4

Scenarios of possible outcomes of food loss reduction and gender equality intervention in the imaginary country of Waseteeland

In Waseteeland, a food loss assessment of the fish value chain finds that a considerable amount of post-harvest loss occurs at the node of processing. The loss is mainly due to inefficient traditional processing methods and bad handling practices. A gender-sensitive analysis reveals that it is mainly women fish processors who are experiencing losses due to the use of inappropriate equipment and lack of knowledge of quality standards. In addition, cultural norms and the domestic workload limit women's access to technology and information and their active participation in fisheries organizations, which are all gender-based constraints. A number of interventions can be designed to reduce post-harvest losses in Waseteeland. Each of them leads to different outcomes on fish loss and gender equality.

Scenario A describes a win-win situation where gender equality leads to fish loss reduction and vice-versa, in a virtuous cycle. In Waseteeland, an intervention under scenario A aims to strengthen women's active participation in fisheries organizations through which services, equipment and training are provided. The outcome of the intervention is that women processors are able to reduce fish losses through improved processing equipment and stronger linkages with the market. Women's participation in fisheries organizations also provides opportunities to voice their needs, to develop skills and confidence, thus improving gender equality. It is important to note that when women and men experience the positive outcomes of food loss reduction and gender equality, they might also be inclined to critically examine the existing social norms and roles, and redefine those they deem harmful or no longer useful. In the long term,

this might lead to an autonomous and gradual transformation of the value chain actors' roles and behaviours towards a more equitable and efficient organization of the fish value chain.

Scenario B portrays a situation where losses are reduced, but gender inequalities are not addressed or even exacerbated. Under scenario B, an intervention provides the fisheries organizations of Waseteeland with improved processing equipment to reduce fish losses. However, if specific measures are not taken to improve the women's knowledge to use these facilities, the reduction of losses might be marginal and temporary. This implies that the equipment would be used only by a limited number of processors, misused or not used at all, thus missing opportunities for additional loss reduction and addressing gender inequalities.

Scenario C represents a situation in which gender equality is improved with no effect or a counter-effect on food loss reduction. If an intervention introduces a quota for women's membership in fisheries organizations in Waseteeland, this would increase the number of women processors who can access improved fish processing equipment. Nevertheless, suppose training and services provided by the fisheries organizations do not take into account the specific needs, preferences and barriers of women in the fish value chain. In that case, they might still not be able to access the equipment (e.g. time constraints) or might choose not to use them. In this case, the fish loss experienced by women processors in Waseteeland would not be reduced.

Scenario D describes the worst case scenario, in which strategies and interventions apply a gender-blind perspective. As a result, they are unsuccessful in reducing fish loss and might exacerbate gender inequalities. Under scenario D, an intervention introduces a new technology for processing intending to target women processors. This technology is extremely efficient in improving the quality of processed fish in line with the formal market's quality standards. However, it requires specific training and constant maintenance to be used effectively. The limited mobility of women processors due to cultural norms and the burden of the domestic care constitutes a barrier for them to access training and maintain the technology, resulting in its abandonment. In some cases, in Waseteeland, men took over women's activities in the processing node (traditionally a women's task) and started using the improved technology. By not duly considering women's and men's different needs and barriers in the fish value chain, this intervention was unsuccessful in significantly reducing losses and contributed to increasing gender inequality.

Source: Based on scenarios provided in FAO. 2018. *Gender and food loss in sustainable food value chains – A guiding note*. Rome, FAO. fao.org/documents/card/en/c/I8620EN

5. CONCLUSION

Addressing the link between food loss and gender is an essential component of the global effort to reduce food loss. Socio-cultural and gender dimensions are often underlying reasons for food loss. As such, sustainable food loss reduction strategies should be gender-sensitive and consider technological and economic solutions, but also solutions that address gender and power relations among value chain actors. The approach proposed by the FAO Guiding Note and reflected in this paper provides a basis for researchers, practitioners and policymakers to better understand gender and food loss linkages in fish value chains and to identify long-lasting solutions (FAO, 2018).

By providing guidance on how to integrate gender concerns into food loss interventions in fish value chains, this paper aims to help address the knowledge gap in this area of work and to contribute to the development of an approach tailored to fish value chains and ultimately to sustainable small-scale fisheries and aquaculture for food security and nutrition. A key next step will be the application of this approach to introduce gender sensitive food loss solutions.

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GLOSSARY

Critical loss point (CLP): Points in the food value chain where food losses have the highest magnitude, the highest impact on food security, and the highest effect on the economic result of the food value chain (FAO, 2016b).

Food loss: Food loss refers to a decrease in mass (dry matter) or nutritional value (quality) of food that was originally intended for human consumption. Food loss is mainly caused by inefficiencies in the food value chains, such as poor infrastructure and logistics, lack of technology, insufficient skills, knowledge and management capacity of value chain actors, and lack of access to markets. In addition, natural disasters play a role (FAO, 2013).

Food value chain: A food value chain consists of the full range of farms and firms and their successive coordinated value-adding activities that produce raw agricultural materials and transform them into food products that are sold to final consumers and disposed of after use in a manner that is profitable throughout, has broad-based benefits for society, and does not permanently deplete natural resources (FAO, 2014b).

Food waste: Food waste refers to the removal of food from the food supply chain, which is fit for consumption, by choice, or which has been left to spoil or expire as a result of negligence by the actor – predominantly, but not exclusively the final consumer at the household level (FAO, 2014a).

Gender: Gender usually refers to masculine and feminine – that is, to qualities or characteristics that society ascribes to women and men, girls and boys, according to their physical characteristics. People, referring to their sex, are biologically born female or male, but learn to correspond to societal expectations. Perceptions of gender are deeply rooted, vary widely both within and between cultures, and change over time. But in all cultures, gender determines power and resources for females and males (FAO, 2017b).

Gender analysis: Gender analysis is a critical examination of how differences in gender roles, activities, needs, opportunities and rights/entitlements affect men, women, girls and boys in certain situation or contexts. Gender analysis examines the relationships between females and males, and their access to and control over resources and the constraints they face relative to each other. It also examines access to development benefits and decision-making at the micro level of the individual, the family and the workplace, the meso or institutional level, and the macro level or the larger natural, social, economic and political environment, with a view to identifying possible gender gaps and the means to eliminate them (FAO, 2018).

Gender equality: Gender equality is when women and men enjoy equal rights, opportunities, and entitlements in civil and political life regarding access, control, participation and treatment. In the international arena and in national contexts, gender equality is a concept that is closely connected to the human rights agenda. Gender equality is also a concept that has an important transformative ability. In order to achieve full gender equality, there is a need to change unequal gender-based power relations and the discriminatory social and gender norms that exist as an underlying cause of gender inequalities (FAO, 2017b).

Gender equity: Gender equity means fairness and impartiality in treating women and men in terms of rights, benefits, obligations and opportunities. At times, special treatment/affirmative action/positive discrimination is required. Gender equity is often used to detach gender equality from the human rights agenda and to avoid talking about the human rights of women and girls. Gender equity only embraces part of the gender equality agenda, as it leaves out the transformative aspect of gender equality and thereby allows the avoidance of the necessary contestation that exists in the status quo in terms of unequal power relations and unequal social, economic and political structures and institutions. Gender equality is the end goal, and equity is the means to get there (FAO, 2017b).

Gender and food loss in sustainable fish value chains in Africa

What changed (Tick/Choose one or more in the listed responses below (and if needed add more options))	Reasons for changes (Choose one or more among the following or add more options if needed): 1/Adverse climatic conditions, 2/Changes in fish species or quantity; 3/Price changes; 4/Consumer changes in products type; 5/The overall economy / trade situation, 6/ Weakening of my capacity/means, 7/other-to be specified)
Fishing area/supply location	
In the : choice of fish species	
In the way you handle/process the fish	
In the way fish is transported	
In the target market	
Other/Specify	

2. Has any change occurred during the past 5 years in your fish operation or trading activity?
If yes, list the top 3-5 of what did change and why?

3. Market access

Type of market	Outlets	How do you get there (Choose one or more among: 1/By walk/specify the walking distance or time 2/air 3/ Car-road transport 4/ motorcycle; bicycle 5/canoe 6/Traders or fishmongers come to me 7/ other-specify	How often do you go there (Choose one or more among: 1/ Daily; 2/ Every 2 days; 3/ Twice a week 4/ Once a week 5/ Once every 10-15 days 6/ Once every month 7/ Other- to be specified	Who/what determines your choice for this market (Choose one or more among: 1/Price offered 2/Consumer preference for the type of product 3/ Volume of product in demand- Ease of supply 4/ Frequency of the market fairs 5/ Easily accessible 6/Existing commercial linkages-partners 7/Familiar to the target country market; 8/I have no other choice 9/other/specify)	Average volume of products per trip/supply period (any measurement unit to be translated in Kg)	Average sale price	Method of payment (Choose between one or more among: 1/Advance payment; 2/Cash at delivery or sale point 3/Credit; 4/ Bartering against other food commodity 5/Other-Specify If more than 2 method of payment, please provide importance/relative shares	5 major constraints to access market or specific outlet (Tick/Choose one or more among: 1/Problem of transportation 2/Various harassments 3/ Difficult; direct sale/too many middlemen 4/Public security situation 5/Customer not rewarding the quality Other-specify
National	Local/fair or market (List the cities/areas)							
	Hotel/restaurant/chop bars							
	Supermarket							
	Hospital/ School feeding prison/Army camp							
	Other (specify)							

Regional	Countries (List the countries):							
International								

FISH LOSS DATA:

	During Bumper season (indicate the months)	During Lean season (Indicate the months)
Volume of fish landed/purchased (Kg)		
Volume of processed fish (Kg)		
Supply source (with who): fisherman/middleman/cold store/import If multiple origins, indicate relative shares (%)		
Average number of days you operate in a month		
Average selling/buying price		
5 critical loss points (descending order of importance). Choices to be made from the List of common stages or add if needed (1/Before hauling back, 2/During hauling back from water; 3/Onboard; 4/Transportation to the landing site; 5/ Landing, 6/First sale/purchase; 7/Transportation to the processing site; 8/Transportation to market, 9/ Sale; 10/Pre-treatment/cleaning; draining; 11/smoking/drying/salting/fermentation/frying/other; 12/Cooling of processed (smoked, dried, fried) fish ; 13/Sorting for packaging; 12/Packaging; 13/Storage; 14/Other-specify		
% quality loss (Or fraction of fish units or of measurement unit)		
Average reduced price of quality loss		
Frequency of quality loss (days/month)		
5 major Causes (descending order) Choices to be made from the List of common causes provided		
% physical loss (Or fraction of fish units or of measurement unit)		
Frequency of physical loss (days/month)		
5 major Causes (descending order) Choices to be made from the List of common causes provided		
% market force loss (Or fraction of fish units or of measurement unit)		
Average reduced price of market force loss		
Frequency of market force loss (days/month).		
5 major causes (descending order of importance). Choices to be made from the List of common causes provided		

Gender and food loss in sustainable fish value chains in Africa

COPING STRATEGIES & VARIOUS OPPORTUNITIES:

1. What are the main measures you take to reduce/prevent or try to reduce your losses?

Possible actions	YES	NO
Try to recoup /Attempt to compensate on the subsequent supply		
Try to apply different method/technique		
Change market		
Change supply source		
Lessening the production costs/economies of scale by using group consignment/transport for marketing or Else)		
Engage in another activity		
Mobility/Migration		
Resignation/Do not see any solution or do not think that something can be done		
Other (please specify)		

2. Previous (past 5-10 years) opportunities for training/support for knowledge upgrade

Training opportunities/support for knowledge upgrade	Provided by	Duration of the training & refresher course if any	Benefits of the training	Issues learnt but not implemented owing to constraints	Which further areas is more training/knowledge upgrade needed?

3. Previous (past 5-10 years) opportunities for access to credit or any material support to your activity

Credit access opportunities or any material support	How many times it was provided	Main sources of credit	Cost & Purpose of credit	Terms of credit	Cost of credit as a proportion of total income

RESPONDENT(S) DETAILS
Name(s)
Phone contacts
Location/site name
Administrative level (1 = Region; 2= Province/district; 3 = Department; 4 = Village, 5= Other/Specify)

Source: FAO. 2017a. *Case studies on fish loss assessment of small-scale fisheries in Indonesia*. FAO Fisheries and Aquaculture Circular No. 1129. Rome.

ANNEX 2

GENDER-SENSITIVE ANALYSIS OF FOOD LOSS AND VALUE CHAIN ACTIVITIES (FAO, 2018)

Table A helps to analyse in-depth the roles and responsibilities of the value chain actors and their specific conditions, including the socio-cultural context in which they operate. To fill it in:

1. Based on the value chain mapping exercise, fill in the columns to describe activities and fish losses (including a rough estimate of the amount of losses) under each node (or critical loss point). The main value chain nodes include production (primary production and harvest), aggregation, handling and storage, processing and packaging, distribution and market, and consumption. This list is not exhaustive and may vary depending on the considered fish value chain.
2. Indicate if it is men or women that are mainly involved or leading the activities under each value chain node (or CLP).
3. Evaluate the conditions under which women and men engage in each node by looking at access to and control over: productive resources; advisory services and training; infrastructure; and knowledge and information – and provide a score. (If other categories are more relevant in the specific context, consider adapting the proposed ones.) The scores range from 1 to 4, where: 1 is bad/very constraining; 2 is moderately good/moderately constraining; 3 is good/enabling; and 4 is excellent/highly enabling. The following questions help to evaluate the conditions and determine a score:
 - ▶ Productive resources: Do the actors own/have access to appropriate technologies and equipment at an affordable price? Do the actors have access to improved seed varieties, fertilizers and pesticides/insecticides? Do the actors have access to credit and financial services?
 - ▶ Advisory services and training: Do the actors have access to advisory services? Is knowledge and training on the optimal practice and use of technologies available? Is training accessible to all actors (is it taking place at times and in venues that are accessible for women and men)?
 - ▶ Infrastructure: Do the actors have access to and control over infrastructures such as storage and cooling facilities, transportation and appropriate technologies for packaging? Do mobility restrictions, time poverty and the work burden hamper the capacity of the actors to access them?
 - ▶ Knowledge and information: Do the actors have adequate knowledge of good and appropriate post-harvest handling practices? Do the actors have access to information about quality and safety standards to avoid discard at the market level?
4. Describe value chain actors' organizational/institutional context: Indicate if they act as individuals, as family workers within their household, or as members of a cooperative, women's groups or producer's organization, or if they are employees of a firm.
5. For the last column, take into consideration the information collected up to this point. The influence of the constraints stemming from household and personal levels should also be considered. Use this information to identify the main challenges that they are facing while carrying out their activities with respect to accessing productive resources, advisory services

and training, infrastructure and knowledge and information. Be specific in describing the challenges faced by the actors and the correlation with fish loss. Recognize challenges that are linked to gender inequalities and score accordingly.

Table A is an example of a gender-sensitive analysis of fish loss and value chain activities. Rows are added to include all possible activities under each value chain node.

► **TABLE A**

Gender-sensitive analysis of fish loss and value chain activities

VALUE CHAIN NODES - CLP	DESCRIPTION OF ACTIVITIES	DESCRIPTION AND ESTIMATE (%) OF FISH LOSSES	WHO IS MAINLY INVOLVED: WOMEN OR MEN	INVOLVEMENT OF WOMEN (SCORE)		INVOLVEMENT OF MEN (SCORE)		ORGANIZATIONAL/ INSTITUTIONAL SETTING (INDIVIDUAL/ HOUSEHOLD LEVEL/ COOPERATIVE/ FIRMS)	CHALLENGES FOR THE ACTORS AND REMARKS ON THE SCORES
				WOMEN	GIRLS	MEN	BOYS		
Pre-fishing	Mending nets	-	Women	2	-	-	-	Individual	Limited knowledge on the appropriate types of nets to use
Fishing	Fishing	30%	Men	-	-	2	-	Individual	Limited fishing gears
Processing	Smoking	30%	Women	1	-	-	-	Cooperative	Inefficient smoking technology (use of traditional smoking oven)

ANNEX 3

FISH VALUE CHAIN PERFORMANCE AND GENDER-BASED CONSTRAINTS (FAO, 2018)

Table B is a continuation of Table A (Annex 2) and provides an in-depth analysis of the challenges cited in Table A. The information collected concerns the underlying gender-based constraints connected to fish losses. To fill in Table B:

1. Describe the assessed challenges (identified in step 1/Annex 1) that actors face at each node of the food value chain (or in CLPs) where losses are experienced.
2. Describe the consequences of the challenges on the value chain's performance and on food losses.
3. Identify the gender-based constraints linked to value chain inefficiencies and food loss. Describe gender-based constraints by making reference to the five categories (limited access to knowledge and information/limited participation and decision-making/limited access to finance/limited access to inputs and resources/ work burden and time poverty). Indicate if they originate at the individual or household level.

► TABLE B

Identifying gender-based constraints from the gender-sensitive analysis table

VALUE CHAIN NODES-CLP	CHALLENGES ACTORS FACE (INDICATE IF MAINLY WOMEN OR MEN)	CONSEQUENCES ON THE EFFICIENCY AND PERFORMANCE OF THE VALUE CHAIN AND FISH LOSS	GENDER-BASED CONSTRAINT(S)
Pre-fishing	Mainly women: limited knowledge on the appropriate types of nets to use	-	-
Fishing	Mainly men: limited fishing gears	Poor equipment, high level of losses, huge quantity of bycatch	Limited access to knowledge and information; limited access to finance; limited access to inputs and resources
Processing	Mainly women: inefficient smoking technology (use of traditional smoking oven)	Poor processing equipment, low product quality, high level of losses, no access to remunerative markets	Limited access to knowledge and information; limited access to finance; limited access to inputs and resources

ANNEX 4

VERIFICATION AND SOCIAL RISK ASSESSMENT OF A SUGGESTED SOLUTION FOR FOOD LOSS REDUCTION: DISSEMINATION OF IMPROVED POST-HARVEST TECHNOLOGIES (FAO, 2018)

Table C lists aspects and key questions that can help determine how a suggested solution for food loss reduction impacts the value chain actors including from a gender perspective (FAO, 2018). The table also provides a column for recommended mitigation measures in case of unwanted impacts. To fill it in:

1. Determine the relevant gender-based and social aspects within the selected value chain.
2. Describe the potential impacts of the suggested solution in each of the chosen aspects.
3. Describe the gender aspect of the impact: how women and men may be affected differently.
4. Suggest solutions to mitigate negative and/or unwanted impacts.

► TABLE C

Determining possible impacts of food loss reduction solutions on the value chain actors

VALUE CHAIN LEVEL	QUESTIONS REGARDING THE POTENTIAL IMPACT OF THE SUGGESTED SOLUTION	DESCRIPTION OF THE POTENTIAL IMPACT	GENDER DIMENSION OF THE IMPACT (HOW WOMEN AND MEN MAY BE AFFECTED DIFFERENTLY)	SUGGESTIONS TO MITIGATE NEGATIVE IMPACTS OR EXACERBATED GENDER INEQUALITIES
Individual level	1. How or does the suggested solution increase or reduce the work burden of value chain actors?	Technologies have the potential to reduce the work burden.	A reduced work burden could greatly benefit women; however, technologies require training and/or knowledge on their use to which women have limited access.	Identify the technologies that have the potential to reduce women's work burden and if possible prioritize them. To mitigate the risk that improved technologies remain unused, provide accessible and appropriate training on their use.
	2. How or does the suggested solution impact the employment situation of the value chain actors?	...	...	...
	3. How or does the suggested solution take into consideration mobility restrictions of value chain actors?	...	...	...

(Cont.)

VALUE CHAIN LEVEL	QUESTIONS REGARDING THE POTENTIAL IMPACT OF THE SUGGESTED SOLUTION	DESCRIPTION OF THE POTENTIAL IMPACT	GENDER DIMENSION OF THE IMPACT (HOW WOMEN AND MEN MAY BE AFFECTED DIFFERENTLY)	SUGGESTIONS TO MITIGATE NEGATIVE IMPACTS OR EXACERBATED GENDER INEQUALITIES
Household level	4. How or does the suggested solution distribute benefits to the value chain actors? (income, access and control)	The introduction of new technologies might increase household incomes due to higher production quantities or reduced losses.	Control over incomes might not be distributed equally among the value chain actors and between women and men, undermining the capacity of women to further invest in food loss reduction.	Ensure that the benefits are distributed equally among the actors. Ensure that women have the opportunity to benefit from higher income possibilities and that they have control over the earned income through direct payment and access to bank accounts. Women's membership in producer organizations and ownership and control over productive resources may enhance their control over household incomes.
	5. How or does the suggested solution impact the nutrition situation of the value chain actors and their families.	...	...	...
Core value chain level	6. How or does the suggested solution impact dynamics of power in the food value chain? (ownership of solutions?)	As practices improve and formerly manual activities become automatized, ownership might move from one group to another.	Men often take over activities that were formerly carried out manually by women and now involve more advanced technological aspects. This might lead to transferred ownership from women to men. As a consequence, food loss experienced by women might not be addressed.	Ensure that women have equal access to newly introduced technologies and receive appropriate training to use them. Ensure cooperation with organizations that have female members. Engage with men to increase awareness of the benefits of working with women to reduce food loss.
	7. How or does the suggested solution raise or increase the need for training in order to apply solutions?	...	...	...
	8. How or does the suggested solution require a degree of organization of value chain actors (e.g. membership in producer organizations)?	...	...	...

(Cont.)

VALUE CHAIN LEVEL	QUESTIONS REGARDING THE POTENTIAL IMPACT OF THE SUGGESTED SOLUTION	DESCRIPTION OF THE POTENTIAL IMPACT	GENDER DIMENSION OF THE IMPACT (HOW WOMEN AND MEN MAY BE AFFECTED DIFFERENTLY)	SUGGESTIONS TO MITIGATE NEGATIVE IMPACTS OR EXACERBATED GENDER INEQUALITIES
	9. How or does the suggested solution cause for some actors' exclusion from the food value chain activities?	...	...	...
Enabling environment	10. How or does the suggested solution coincide with cultural and social norms and will be culturally and socially acceptable?	Some technologies or new practices might be considered unsuitable for some value chain actors due to social and cultural norms.	Women might feel uncomfortable or be excluded from the use of certain technologies for social and cultural reasons.	<p>Be informed of social and cultural norms. Ensure that the suggested solutions do not contribute to the exclusion of women.</p> <p>Use participatory approaches to engage with the target group to develop and disseminate appropriate technologies and practices to foster uptake.</p> <p>Consider working at the community and household level with men in order to gradually change discriminatory socio- cultural norms.</p>

GENDER AND FOOD LOSS IN SUSTAINABLE FISH VALUE CHAINS IN AFRICA

Food losses are a major concern and occur in most fish distribution chains worldwide. Not only do losses constitute lost income to fishers, processors, and traders, but they also contribute to food insecurity. Progress has been made in identifying the direct causes of fish losses and quantifying the magnitude of the loss. However, loss reduction strategies have tended to focus on technological solutions and hence have overlooked the relevance of socio-economic factors, including gender relations, that influence the functioning of the fisheries value chain. This document provides guidance on integrating gender concerns into food loss interventions within the fish value chains. It describes the different steps to understand the key components of a gender-sensitive food loss value chain analysis. In particular, it recommends highlighting the dynamics and factors that influence women's and men's natural social disposition and participation in fisheries activities according to dominant assigned gender roles. While addressing the existing knowledge gaps and contributing to the development of an approach tailored to African small-scale fish value chains, this document also provides introductory information on the application of the FAO Gender-Responsive Fish Loss Assessment Methodology (GRFLAM).

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