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A systemic approach for aquatic food value chains resilience

Exploring the contribution of aquatic food value chains to global food systems transformation

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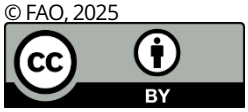

A systemic approach for aquatic food value chains resilience

Exploring the contribution of aquatic food value chains to global food systems transformation

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Abstract

This paper was prepared to inform debate at the Blue Food Forum organized by the FISH4ACP programme, held in the United Republic of Tanzania in September 2024. The forum discussed the key features of aquatic food value chains (VC) development approaches and their implications for global food system transformation and for the economic, environmental and social development of communities and countries.

This paper analyses the methodology and practices deployed by FISH4ACP to enhance the resilience of aquatic food value chains, with the objective of providing recommendations to adapt and improve the programme's strategy. The methodological framework of the FISH4ACP programme essentially envisions VC resilience as a "scaffold" in support of VC development and strives to strengthen the individual and collective capacities of private sector VC operators, so as to minimize disruption in VC transactions in the presence of exogenous shocks. However, in practice the programme appears to be pursuing also resilience-enhancing strategies that go well beyond the scope of this methodology and the boundaries of VCs.

According to FISH4ACP in-country programme managers, the main shocks faced by aquatic food VCs include: i) COVID-induced restrictions to the movement of people and goods, leading to increased transaction and transportation costs, and price inflation especially for imported feed for fish farming, but also for aquatic and other food destined for human consumption; and ii) environmental or natural shocks, including extreme climatic conditions disrupting access to marine and inland fish stocks, as well as fresh water availability for aquaculture, compounded by human-induced destruction of mangroves through oyster harvesting.

Some of the coping strategies pursued by the programme appear to be consistent with its VC resilience methodology, as they support: i) local feed production for aquaculture, to reduce dependency on imports; ii) VC associations, to reduce transaction and transportation costs; and iii) aquatic food product diversification, as well as the adoption of climate-proofed infrastructures and vessels, and safer fishing practices, to mitigate the impact of natural disasters. Still, several other coping strategies pursued by the programme do not directly support VCs but are aimed at maximizing the indirect support that these VCs receive from institutions governing food markets, disaster prevention and responses, social protection, weather information and climate preparedness, as well as common natural resources.

Exogenous shocks are associated with systemic failures – such as market failures and tragedy of the commons – which arguably induced the FISH4ACP programme to look beyond its methodological boundaries and pursue broader or systemic coping strategies. Systemic approaches of this kind are increasingly supported by a growing body of literature, which stems from the realization that VC approaches tend to: i) be insufficient to cope with systemic failures; and ii) create negative trade-offs, given that any support provided to a food VC has the potential to put other VCs in a disadvantaged or more vulnerable position, or to create undesired environmental and social externalities. Therefore, this paper guides the FISH4ACP programme in reframing its VC resilience methodology and adopt a broader food system approach.

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Abbreviations

ACP	African, Caribbean and Pacific (States)
BMZ	(German) Federal Ministry for Economic Cooperation and Development
CIRAD	French Agricultural Research Centre for International Development
DG INTPA F3	Directorate-General for International Partnerships, sustainable agri-food systems and fisheries
FAO	Food and Agriculture Organization of the United Nations
FS	food system
ICRA	International Centre for development oriented Research in Agriculture
ISA	School of Agriculture (of the University of Lisbon)
KIT	Royal Tropical Institute, the Kingdom of the Netherlands
LMIC	low- and middle-income country
OACPS	Organisation of African, Caribbean and Pacific States
SASI-SPI	Sustainable Agri-Food Systems Intelligence – Science Policy Interface
SLU	Swedish Swedish University of Agricultural Sciences
VC	value chain


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1. Introduction

This is one of four background papers prepared in advance of the forum to inform discussions. It focuses on a key objective of the FISH4ACP programme: how to strengthen the resilience of aquatic food value chains?

This question is justified by evidence suggesting that food insecurity and malnutrition are on the rise worldwide, as a result of increasingly frequent and intense shocks associated with climate change and natural disasters, disease outbreaks, market failures and economic recessions, conflicts and wars. According to FAO's State of Food and Agriculture report (2023) the intensification of these exogenous shocks is having a particularly negative effect on the quality of diets worldwide, contributing to malnutrition associated with rampant obesity, wide-spreading non-communicable diseases (diabetes, hypertension, cancer, micronutrient deficiencies, etc.) and incremental labour productivity losses. The consequences of unhealthy diets are more evident in high-income countries but are rapidly rising also in middle- and low-income countries.

Unhealthy food is a well-known problem in Latin America, with Mexico leading the fight against child obesity. And according to Reardon *et al.* (2021) African consumers have also and consistently purchased increasing amounts of "empty" calories, or highly processed and poorly nutritious food over the past 50 years. Estimates indicate that over one-third of the world population (2.83 billion people) cannot afford a healthy diet (FAO-SOFA, 2023). Efforts to improve the quality of diets strive also to cut the consumption of red meat, especially in high- and middle-income countries. These efforts are also justified by environmental reasons, as a reduction in intensive meat production has the potential to reduce GHGs and nitrogen emissions, as well as deforestation.

Aquatic foods have the potential to become the main substitutes for red meat and contribute to improved global nutrition. Aquatic foods already provide 17 percent of the total amount of animal protein consumed worldwide, serving as the primary source of protein for one billion people. Besides being a healthy source of protein, aquatic foods are a critical source of fatty acids such as docosahexaenoic acid (DHA) and eicosapentaenoic acid (EPA), and micronutrients such as iron, zinc, calcium and vitamins.

These nutrients are essential for healthy prenatal and childhood development, as well as adult health. In low-income countries, 845 million people depend on aquatic foods for their intake of essential proteins and micronutrients. Some aquaculture species like bivalves and fish (silver carp, bighead card, trout and carps) are especially nutrient-rich compared to terrestrial animal source foods, offering potential in addressing micronutrient deficiencies, particularly burdensome below the Sahara and in South and Southeast Asia. Small fish, consumed whole, are particularly rich in multiple

micronutrients, including calcium, and they also favour the absorption of micronutrients found in other, plant-based foods. These are still relatively affordable foods compared to other animal source foods in many low- and middle-income countries and can be purchased in small quantities, making them a high-quality protein source accessible to a great proportion of these populations. Increased availability of aquatic foods and reduced production of red and processed meat thus have the potential to minimize the risk of non-communicable diseases and rising emissions. In comparison with other sources of protein like meat, the production of aquatic foods is often more resource-efficient, requiring less land and water. Fish and seafood can also convert feed into edible flesh more efficiently. Aquatic food production has also the potential to grow to much higher levels, especially through aquaculture putting less pressure on the environment. Overall, available evidence thus points to a promising future for aquatic food value chains, provided that they can build up their resilience in the face of increasingly frequent and intense exogenous shocks (EU, FAO, AGRINATURA, 2023).

The remainder of this paper thus analyses the methodology and practices deployed by FISH4ACP to enhance the resilience of aquatic food value chains, with the objective of providing recommendations to adapt the programme's strategy and improve its effectiveness. To do so, the next sections present a desk review of the following material: i) the methodological approach adopted by FISH4ACP to strengthen value chain resilience; ii) strategic proposals for aquatic food value chain development prepared by the staff of FISH4ACP in 12 African, Caribbean and Pacific (ACP) states; iii) lessons from implementation of the FISH4ACP programme related to value chain shocks, vulnerabilities and programme interventions; and iv) relevant scientific and grey literature.

2. Theory

Resilience is a rather ambiguous or "amorphous" concept that can be interpreted in many different ways and is particularly hard to measure (Béné and Devereux, 2023; Upton *et al*. 2023; De Pinto *et al*. 2023). The methodological guidelines of the FISH4ACP programme defines resilience as "the capacity of an agri-food value chain to continue generating and delivering value in the face of abrupt or gradual disturbances in supply or demand through anticipation, prevention, absorption, adaptation and transformation".

Therefore, it is important to stress that the programme's definition is explicitly focused on value chains, as opposed to individuals, communities, systems or countries. Furthermore, the FISH4ACP methodology singles out three key elements: the capacity of value chain enterprises and industries (i.e. private sector capacity); the need to keep generating and delivering value (profits, products and services); and the presence of abrupt and gradual shocks as opposed to long-term trends. In a nutshell, the FISH4ACP methodology envisages resilience as a "scaffold" in support of value chain development. Based on this definition, when resilience declines (and vulnerability increases) a value chain moves closer to a critical threshold where shocks have negative disruptive effects on value creation and delivery.

In more detail, the methodology adopted by the programme is geared to strengthening value chain resilience through value chain-specific interventions focusing on six domains (the first three of which are structural in nature, while the last three are behavioural):

- *Redundancy*, which refers to having excess capacity within the value chain, in terms of facilities, equipment, finances, stocks, numbers of actors performing the same function, etc. Having excess capacity and backup systems enables the maintenance of the value chain's core functionalities in the event of shocks.
- *Diversity,* which refers to having multiple components and substitutes with different risk profiles within the value chain. The more diverse the value chain components are and the less dependency there is on one element (one actor, one input, one services provider, one location, etc.), the less likely a shock will wreak havoc on the value chain.
- *Connectivity,* which refers to the presence of strong connections between value chain actors, within the same group (among fishers or retailers) as well as across different groups. Having good connectivity between these components helps to quickly identify problems and needs, facilitate flows that boost recovery and mitigate the effects of shocks on any given component.
- *Collaboration* (vs competition) *and governance,* which refers to how value chain actors collaborate to achieve common purposes, especially on resilience aspects. Collaboration enhances resilience capacities since risks are shared among actors in the same group and across groups.
- *Learning and adaptation,* which refers to the levels of flexibility and innovation in the value chain, in particular with respect to past shocks. It assesses how the value chain is gradually strengthening or weakening its ability to absorb, adapt and transform, and if the distance to tipping points is shrinking or growing.

- *Participation and inclusion,* which refers to the empowerment and engagement of the full range of value chain actors. Do all have a say, especially in how to prepare for, deal with and recover from shocks? Broad participation allows to make better informed management decisions, reducing vulnerabilities and increasing overall resilience.

From this perspective, solutions to value chain vulnerability are primarily being sought within the value chain itself, by anticipating or putting in place prevention strategies prior to a shock, and by increasing the ability of the value chain to absorb, adapt and, if necessary, transform after a shock. However, this methodological framing appears to be at odds with a growing body of development literature recognizing the need to adopt a wider and more integrated perspective, framed around "food systems". Cutting-edge development theory suggests that the fundamental determinants of resilience or the ultimate solutions to vulnerability often lie outside the control and influence of value chain actors (Béné and Devereux, 2023; Béné *et al*., 2008; Béné *et al*. 2009). As such, value chain resilience is rather defined by the overarching food system within which a value chain operates. According to the High Level Panel of Experts on Food Security and Nutrition (HLPE, 2017), a food system encompasses multiple value chains, as well as the resources, infrastructures and institutions that enable all activities related to the production, processing, distribution, preparation, consumption and disposal of food. Therefore, the premise is that the food and nutritional security of the world's population no longer depends just on the performance of standalone value chains, but rather on the capacity of the entire food system. It follows that a food system perspective could provide a more comprehensive and effective methodological approach for the FISH4ACP programme moving forward.

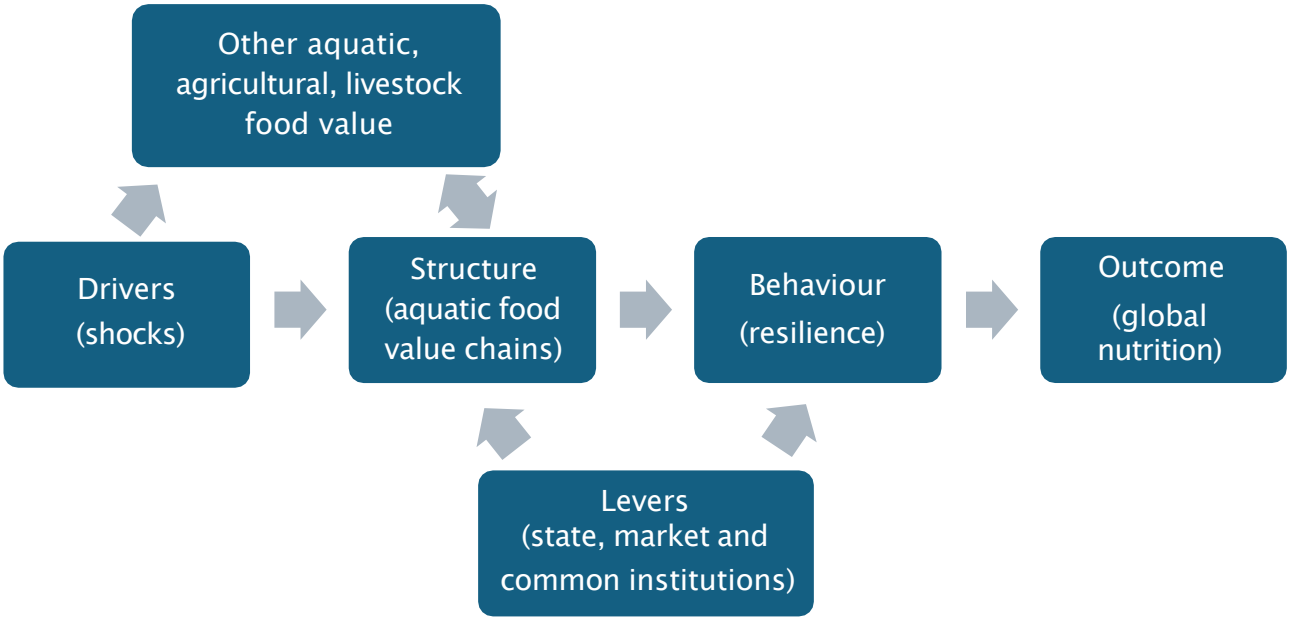
To illustrate, imagine a scenario where a value chain meets all the resilience criteria enlisted above (redundancy, diversity, connectivity, collaboration and governance, learning and adaptation, and participation and inclusion), so that it could be defined as a resilient value chain. Yet if the local food system collapses, value chain operators would be unable to nourish themselves and sustain their productive, trading, processing, retailing and exporting operations. For example, an armed conflict might severely disrupt the functioning of a local food system, by interrupting food transportation through armed attacks and roadblocks, preventing supplies from reaching shops and markets in a certain region for several months. It follows that even if a value chain was able to meet the resilience criteria of the FISH4CP methodology, it may still not be able to continue its operations. The COVID-19 crisis provided a vivid illustration of the need for a food system approach. In Ethiopia, for instance, Hirvonen *et al*. (2020) document how mobility restrictions and lockdowns led to the disruption of most domestic food value chains, regardless of their intrinsic resilience capacity. A similar level of disruption was also observed across different food value chains in India (Varshney *et al*., 2020), Bangladesh (Termeer *et al*., 2020), Senegal (Tounkara, 2020) and Colombia (Burkart *et al*., 2020). This kind of evidence justifies the need for a food system approach, as a departure from traditional, sectoral and technical approaches that have a narrowly defined developmental focus and scope.

One of the critical characteristics of all food value chains operating in low- and middle-income countries (LMICs) is that most daily and seasonal labourers, as well as self-

employed men and women, typically operate in the informal sector (Resnick, 2017; Roever and Skinner, 2016; Young, 2018). This informality starts at the production level, with entire communities of smallholding fishers and farmers generally working informally (Lowder *et al*., 2014; McCullough *et al*., 2010). If they do not sell their production themselves in local markets, they sell it to middlemen (aggregators, wholesalers and brokers), the vast majority of whom are also working in the informal sector (Porter *et al*., 2007; Veldhuizen *et al*., 2020). This involves, among others, women who smoke and process fish directly at home (Akintola and Fakoya, 2017). Further along the value chains, the retailing segment is also often dominated by a high degree of informality, both in its structures (open markets, street vending and corner stores) and in its transactional arrangements (informal contracts) (Cadilhon *et al*., 2006; Kawarazuka *et al*. 2018; Roever and Skinner, 2016; Smit, 2016). These informal or semi-formal businesses are sources of revenue and income for a large number of poor but economically active people, for whom these activities often represent a last-resort livelihood. But with informality often comes invisibility in official statistics, exclusion from public support and social protection services, and thus increased vulnerability (Kolding *et al*., 2014). In LMICs, small-scale producers and food suppliers usually operate under extremely difficult conditions, as they face poor or obsolete infrastructure such as roads, power supply, irrigation and market facilities (Maloney, 2004), have insufficient access to financial services, in particular, credit and insurance (Oviedo *et al*., 2009) and are highly dependent on weather conditions (Harvey *et al*., 2014). The informal nature of their activities, combined with insufficient cash flow, economic marginalization and in some cases discrimination and harassment (Kawarazuka *et al*., 2018), thus exacerbates their vulnerability.

The formalization or institutionalization of food value chains should then be seen as central to a food system approach for value chain resilience. The adoption of such a systemic approach would, however, require FISH4ACP to look beyond its value chain resilience methodology and refocus on local, national and international institutions that have the potential to reduce the vulnerabilities of aquatic food value chains. A paradigmatic shift of this kind will inevitably entail significant complexity and inertia, but is justified by the need to overcome the intrinsic limitations of a value chain approach. In particular, the adoption of a food system approach that focuses on transversal institutions would allow to anticipate the rise of negative trade-offs among aquatic food value chains, as well as between these latter and other (agricultural and livestock) food value chains, as well as undesired environmental and social externalities. Conversely, a silo approach focusing on specific value chains is expected to put other value chains in a disadvantaged or more vulnerable position, thus creating winners and losers and resistance to change. The proposed food system approach can be therefore simplified and visualized as follows (Figure 1).

FIGURE 1. A SYSTEMIC APPROACH FOR AQUATIC FOOD VALUE CHAIN RESILIENCE



Source: Adapted from **Karantininis, K., Le Cotty, T., Ortiz Rios, R. O., Vagneron, I., Perez, M., Laanouni, F., Clement, J., Albuquerque, G., Francesconi, N. & Lee,** M. 2024. Conceptual Framework & Methodology for Sustainable Aquatic and Agricultural Food Systems. AGRINATURA: SLU, CIRAD, ICRA, ISA, KIT.

3. Practice

In Table 1 we summarize the main shocks, key vulnerabilities experienced so far by the aquatic food value chains supported by the FISH4ACP programme, and the support strategies put in place by the programme.

TABLE 1. FISH4ACP VALUE CHAIN RESILIENCE PRACTICES

Country & value chain	Shocks & vulnerabilities	FISH4ACP programme support strategies
Dominican Republic local/artisanal marine fishery (Mahi-Mahi)	Seasonal and recurrent hurricanes. Local fishers use mostly artisanal boats unsuitable for their needs, and struggle to access support from the National Disaster Prevention, Mitigation and Response System as well as from the public social security system.	i) Manage the explicit inclusion of the fishing sector in the National Disaster Prevention, Mitigation and Response System and train actors in using related digital tools (to predict storms and waves); ii) Design an improved fishing vessel model that is safer on rough sea conditions; iii) Help value chain actors and the authorities expand access to the public social security system.
Zambia local/artisanal small lake pelagic	Storms with waves that lead to the closure of all fishing activities on Lake Tanganyika during the high fishing season. Given the high reliance of local communities on fish, a general lack of training on fishing safety and the absence of alternative income-generating activities, fishing bans during stormy days either induce fishers to go fishing anyway, and risk their lives, or expose their households to food insecurity.	i) Develop alternative livelihoods or income-generating activities for local communities; ii) A dedicated training programme on fishing safety (training of trainers, in-person, online, including material for illiterate trainees); iii) Improve safety equipment for fishing.
Senegal local/artisanal women-led oyster farming	Man-made destruction of mangrove, due to wild oyster harvesting practices.	Promote transition from oyster harvesting to oyster farming as a strategy to reduce destruction of mangrove.
Gambia local/artisanal women-led oyster farming	COVID-19 pandemic resulting in access barriers to markets and decline in the number of buyers due to mobility restrictions and reduced purchasing power. The pandemic emphasized the need to reduce over-reliance on one single type of product (boiled/steamed oysters) and one marketing channel (local markets).	i) Develop a management plan to avoid the destruction of the mangroves; ii) Diversify products and create higher value ones (fresh oysters, vacuum-packed, bottled for oyster products, and use of shells in handicraft, jewellery and as ingredients for poultry feed) and create new institutional markets (restaurants, supermarkets or hotels).

Country & value chain	Shocks & vulnerabilities	FISH4ACP programme support strategies
Sao Tome and Principe local/artisanal marine fishery small pelagic	COVID-19 pandemic resulting in access barriers to markets and decline in the number of buyers due to mobility restrictions and reduced purchasing power.	i) Diversify the type of products and extend shelf-life (fish in jars, vacuum-packed fish); ii) Improve products storage and transportation by introducing equipment adapted to local tropical temperatures; iii) Train and create local capacity to build better boats with appropriate cold storage. iv) Support to self-help fisher groups.
Guyana commercial export/frozen & local/artisanal fresh Atlantic seabob shrimp	Heavy rainfalls disrupt the migratory patterns of seabob shrimp, making them harder to find for fishers and leading to lower catches. Extreme price volatility on the global seafood market can lead to sudden drops in the price of seabob with significantly impact om fishers' income. Rising fuel prices can eat into fishers' profits, making it more expensive to operate their boats.	i) Strengthen institutions, improve capacity of Fisheries Department and empower fishing associations; ii) Promote diversification/innovation through development of value-added products and new sustainable technologies to help fishers adapt to market and climate vagaries; iii) Training programmes on climate change preparedness; iv) Social safety nets to provide financial buffers for fishers during difficult periods.
Zimbabwe smallholder tilapia aquaculture	Restrictions related to COVID-19 affected fish marketing activities. Fish farming was also affected due to reduced availability and soaring price of imported fish feed. Feed prices are dictated by the global market creating major uncertainty for local aquaculture production.	i) Support the production of alternative feed to limit dependency on imported feed. Trials are ongoing to develop domestic insect-based feed (black soldier fly) as well as feed produced by smallholder farmers based on locally available ingredients. ii) Support the revision of the entire fisheries and aquaculture legal framework (in collaboration with another programme).
Cameroon artisanal and industrial export Atlantic shrimp	COVID-19 affected the value chain due to movement restrictions and market closures, combined with poor availability of shrimps. After COVID-19 there was a spike in fuel prices, resulting in increased costs along the value chain and increased prices for shrimp consumers (and thus reduced demand). Finally, Cameroon was red-carded by the EU as a non-cooperating country with regard to illegal, unreported and unregulated (IUU) fishing.	i) At the value chain level, apart from supporting operators in adapting to these various shocks in any possible way, potential solutions appear to fall outside the scope and capacity of the FISH4ACP programme. ii) With regard to IUU, FISH4ACP has helped improve the shrimp management framework, by notably designing a pilot onboard observer programme. It also contributed to the revision of the fisheries law.

Country & value chain	Shocks & vulnerabilities	FISH4ACP programme support strategies
Marshall Islands industrial offshore export marine fishery (tuna)	In 2020, there was a 60–70 percent reduction in tuna transshipment due to a COVID-19-related 14-day port access restriction. COVID-19 affected business significantly and also caused disruptions in the shipping of food to the islands. This contributed to increased food insecurity and decreased diversity of diets within the islands, given that the population is highly dependent on imported food. El Niño and La Niña also caused a reduction in the amount of tuna available around the islands.	Enhance the ability of the value chain to attract tuna catches onshore for containerization, rather than rely on transshipment.
Côte d'Ivoire local cooperative Nile tilapia aquaculture	The COVID-19 crisis led to a slowdown in value chain activities and sales, and disruptions to logistics and access to inputs (feed, fry). A long drought in 2021 also reduced water availability for aquaculture. Many floating cages for fish farms were destroyed in the process. The war in Ukraine has increased the price of imported extruded feeds by 20–40% in a sector where the cost of feed accounts for 60% of total fish production costs.	i) Strengthen collective action and organization of value chain operators to promote and facilitate commercial transaction and access to finance; ii) Build capacity of government officials to help manage and support the value chain, through the establishment of a public–private exchange framework that strives to enable value chain actors to be more closely involved in policymaking process.
Nigeria domestic women- & youth-led catfish aquaculture	Nigeria's fuel subsidy removal and the devaluation of the Naira led to hyperinflation, and in particular to a surge in the price of imported goods (e.g. feed and equipment) and fuel, which are essential for the functioning of the value chain, thus reducing cash availability among value chain operators and the purchasing power of consumers.	i) Pilot solar energy for fish farms and alternative feeding ingredients (black soldier fly); ii) Improve farming and processing efficiency practices (smoking equipment in Nigeria); iii) Provide feed on credit and training on business planning and financial literacy.

Source: Consultations with FISH4ACP programme staff, 2024

4. Conclusions and key learnings

The most frequently mentioned shocks in Table 1 are associated with COVID-19-induced restrictions to the movement of people and goods, which in most cases were followed by inflation, rising transaction and transportation costs all along aquatic food value chains, and by a reduction in consumers' purchasing power. Inflation particularly affected imported goods, such as fuel, feed for aquaculture and food for human consumption. Climatic and natural shocks appeared to be also frequent and important. Hurricanes, storms with waves, heavy rainfalls and El Niño and La Niña contributed to disrupting access to fish stocks. Droughts led to reduced freshwater availability for aquaculture. And man-made destruction of mangroves caused by oyster harvesting led to biodiversity losses. Conflict-related shocks were also mentioned in reference to illegal, unreported and unregulated (IUU) fishing in Cameroon leading the EU to impose a trade ban, and the effect that the war in Ukraine had on inflation and more specifically on the price of fuel and feed for fish-farming.

Overall, aquatic food value chains seem to be particularly vulnerable to shocks resulting in market failures associated with trade and movement restrictions, extreme price inflation and volatility. Aquatic food value chains appear to be also vulnerable to shocks, leading to "tragedy of the commons", or to reduced availability of key natural resources such as fish stocks, mangroves and freshwater. However, the governance of both markets and commons entails an approach that goes well beyond the scope of the value chain resilience methodology adopted by FISH4ACP. This is also pointed out by the programme manager in Cameroon, who concludes that: "At the value chain level, apart from supporting operators in adapting to these various shocks in any possible way, potential solutions appear to fall outside the scope and capacity of the FISH4ACP programme."

The programme's resilience-enhancing strategies that directly support value chains appear to involve: the production of alternative and local feed for aquaculture; the distribution of subsidized feed or feed on credit; the establishment of value chain associations; the diversification of aquatic food products, to extend shelf life and add value; and investments in value chain transportation and storage as well as in climate- proof vessels and safer fishing equipment and practices. Still, several resilience- enhancing strategies rolled out by the programme across ACP countries appear to transcend value chain boundaries. In practice, the programme appears to be also pursuing strategies that are directed to support governmental and non-governmental institutions in developing policies and regulations, infrastructures and services for disaster prevention and response, social protection, weather information and climate preparedness, as well as natural resources management. In a few countries, FISH4ACP managers are even advocating for diversification beyond aquatic food value chains, in support of the development of other food (agricultural or livestock) value chains, as a resilience-enhancing strategy. In Zimbabwe, the programme is supposed to support the value chain for farmed tilapia, but it is also supporting the revision of the entire fisheries and aquaculture legal framework, in collaboration with other programmes.

Therefore, we conclude that the value chain resilience methodology adopted by FISH4ACP is either limiting or failing to guide the scope of the programme's strategy. It follows

that our main recommendation for the FISH4ACP programme moving forward is to reframe its methodological approach to resilience on the basis of a more holistic, food system perspective. Although the conceptualization and operationalization of a food system approach can be a complex endeavour, FISH4ACP has the opportunity to do so in a very pragmatic manner, starting from thorough assessments of the systemic strategies that are already pursued by the programme across countries.

In doing so, special attention should be given to strategies providing technical and financial support to institutions governing food markets, disaster prevention and responses, social protection schemes and safety nets, weather information and climate preparedness services, as well as common natural resources, for these to:

formalise the status of aquatic value chains and systematically address their key vulnerabilities; with the purpose of developing resilient aquatic food systems;

convene and moderate multistakeholder consultations to address negative trade- offs arising among aquatic food value chains, and/or between these and other (agricultural and livestock) food value chains, as well as undesired environmental and social externalities; with the purpose of reducing negative externalities (do no harm) and overcoming resistance to strategy uptake and operationalization;

raise public awareness about the nutritional benefits associated with the consumption of aquatic foods, in comparison to other animal source foods (especially red meat), in a global scenario characterized by persistent food insecurity, wide-spreading obesity and non-communicable diseases; with the purpose of justifying the development of policies in support of resilient (as well as sustainable and inclusive) growth of aquatic food systems;

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This paper analyses the methodology and practices deployed by FISH4ACP to enhance the resilience of aquatic food value chains, with the objective of providing recommendations to adapt and improve the programme's strategy. It was prepared to inform debate at the Blue Food Forum organized by FISH4ACP, held in the United Republic of Tanzania in September 2024.

The forum discussed the key features of aquatic food value chain development approaches and their implications for global food system transformation and for the economic, environmental and social development of communities and countries.

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