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AQUACULTURE OVERVIEW IN THE COPPESAALC COUNTRIES

Introduction

This document provides a synthesis of the current status of aquaculture in Latin America and the Caribbean (LAC), as part of the background information for the sectoral analysis in the framework of the XVIII Session of COPPESAALC. This paper was prepared according to FAO's biennial sectoral publication, *The State of World Fisheries and Aquaculture 2022*¹, the FishstatJ data base² and the Regional review on status and trends in aquaculture development in Latin America and the Caribbean – 2020 (Wurmann, Soto and Norambuena, 2022)³.

Total Aquaculture Production in LAC for the 2019-2020 biennium

Aquaculture production in the LAC region produced a total of 3.75 million tonnes of food products (excluding seaweed production) in 2020. Aquaculture contributed 23.41 percent to the total fish production (fisheries and aquaculture) in the region, excluding seaweed, showing a growing trend despite the COVID-19 pandemic (Figure 1), with a 6.77 percent increase between 2019 and 2020. During the last decade, aquaculture production slowed down from an average annual growth of 8.3 percent in the 2000-2010 decade, to an average annual growth of 7.3 percent in the five-year period 2010-2015 and 7.1 percent in the five-year period 2015-2020.

¹ FAO.2022. *The State of World Fisheries and Aquaculture. Towards a blue transformation*. Rome, FAO. <https://doi.org/10.4060/cc0461es>

² FAO. 2023. FAO Fisheries and Aquaculture Statistics 2020. World aquaculture production 1950-2020 (FishstatJ). Ar: Fisheries and Aquaculture Division [online]. Rome. Updated in 2023. <https://www.fao.org/fishery/statistics-query/es/aquaculture>. FishstatJ data are continuously adjusted, even for previous years.

³ Wurmann, C. Soto, D., Norambuena, R. 2022. Regional review on status and trends in aquaculture development in Latin America and the Caribbean – 2020. FAO Fisheries and Aquaculture Circular No.1232/3. Rome, FAO. <https://doi.org/10.4060/cb7811en>

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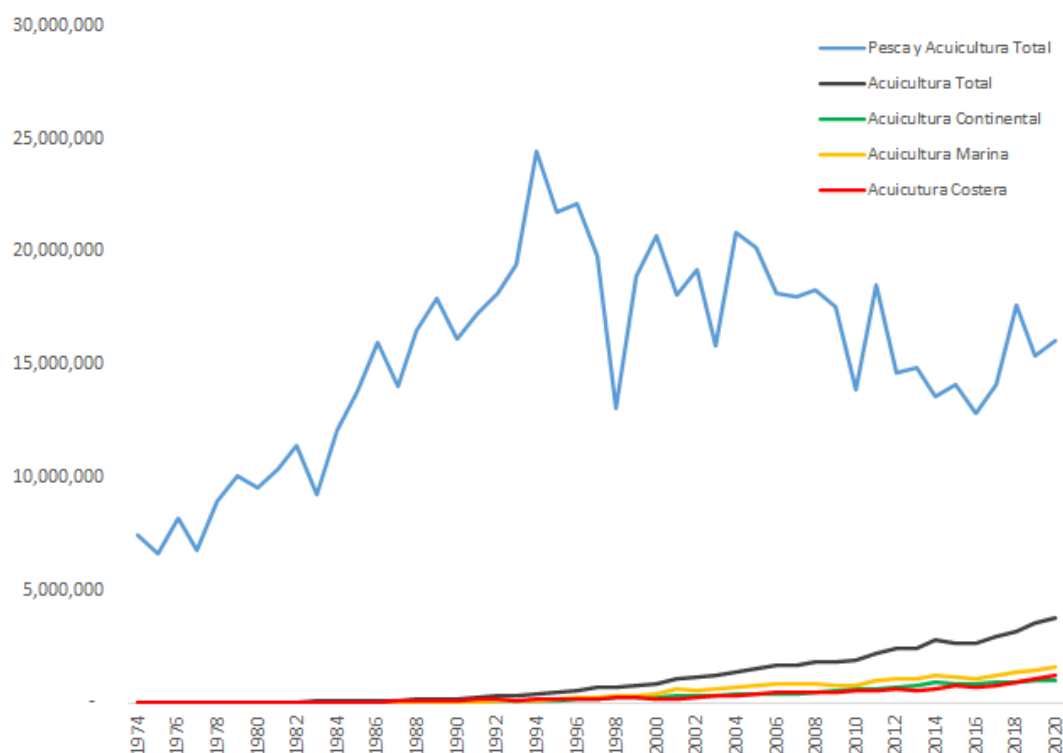


Figure 1. Total aquaculture production in LAC from 1974 to 2020 (FAO-FISHSTAT, 2023)

There are clear sub-regional asymmetries in the region in terms of development and aquaculture production. Of the total aquaculture production in LAC, South America contributed 87.39 percent in 2020, Central America 11.77 percent and the Caribbean 0.84 percent. Globally and in the same order, these sub-regions contributed 3.75 percent, 0.51 percent and 0.04 percent respectively, in terms of global aquaculture production (Table 1).

Table 1. Volume of aquaculture production by LAC sub-region for the years 2015, 2019 and 2020; its contribution to global and LAC production and growth rate for the period 2015 to 2020 (aquatic plants excluded)

Subregion	2015	2019	2020	Contribution to LAC aquaculture in 2020 (%)	Contribution to global aquaculture in 2020 (%)	Growth rate 2015 - 2020
Caribbean	36,365	32,690	31,530	0.84%	0.04%	-2.35%
Central America	357,499	418,333	442,114	11.77%	0.51%	3.60%
South America	2,271,941	3,066,810	3,282,348	87.39%	3.75%	6.32%
Total LAC	2,665,805	3,517,833	3,755,992	100%	4.3%	5.88%
Total global	72,778,145	82,095,054	87,502,609			3.12%

The reported value of regional aquaculture production in 2020 was USD 15.6 billion, representing 5.9 percent of the global value of aquaculture products. The growth in production value in LAC for the period 2015 to 2020 was 3.75 percent. By sub-region, the growth in

production value for South America, Central America and the Caribbean was 3.57 percent; 5.55 percent and (-1.31) percent respectively. In the region, the relative mean value of aquaculture farming (USD/kg produced) has been steadily high, especially in South America. This is a distinctive feature of the LAC region compared to that of other continents (Table 2).

Table 2. Value of aquaculture production for LAC in USD and by region, 2015, 2019 and 2020 (aquatic plants excluded)

Subregion	2015	2019	2020	Contribution to LAC aquaculture in 2020 (%)	Contribution to global aquaculture in 2020 (%)	Growth rate 2015 - 2020	Relative value 2020 (USD/Kg)
Caribbean	58 849	61 913	54 379	0.35%	0.02%	-1.31%	1.72
Central America	1 232 488	1 708 263	17 04 654	10.91%	0.64%	5.55%	3.86
South America	11 234 355	15 920 091	13 863 176	88.74%	5.23%	3.57%	4.22
Total ALC	12 525 692	17 690 267	15 622 209	100%	5.9%	3.75%	4.16
Total global	47 796 466	131 214 611	264 958 645			33.03%	3.03

Aquaculture production in LAC is dominated by Chile, Ecuador and Brazil, which contributed 76.9 percent of total regional production in 2020. Chile is the main producer contributing 39.6 percent (Table 3). These countries, together with Mexico, Colombia and Peru, account for 93 percent of the region's aquaculture production. Some countries such as Honduras, Venezuela, Guatemala and Nicaragua have increased their production, ranking among the top 10 producing countries in LAC.

Table 3. Aquaculture production and contribution by country for the LAC region; growth rate for the periods 2015 to 2019 and 2019 to 2020 (aquatic plants excluded)

Country	Position		Production (Tonnes)			Country contribution to total aquaculture in 2020 (%)	Growth rate (%)	
	2000	2020	2015	2019	2020	LAC	2015-2019	2019-2020
Chile	1	1	1 045 790	1 384 707	1 485 896	39.6%	24.48%	7.3%
Ecuador	2	2	426 710	695 790	774 529	20.6%	38.67%	11.3%
Brazil	3	3	577 643	599 550	629 450	16.8%	3.65%	5.0%
Mexico	4	4	211 562	251 232	278 694	7.4%	15.79%	10.9%
Colombia	6	5	95 857	171 025	179 351	4.8%	43.95%	4.9%
Peru	5	6	90 975	161 279	143 830	3.8%	40.90%	-10.8%
Honduras	8	7	55 100	68 100	71 151	1.9%	19.09%	4.5%
Boliv Rep of Venezuela	10	8	18 911	35 610	49 108	1.3%	28.26%	37.9%
Guatemala	12	9	22 248	31 000	33 651	0.9%	27.39%	8.6%
Nicaragua	11	10	24 536	29 500	29 410	0.8%	16.83%	-0.3%
Cuba	7	11	32 056	27 101	26 200	0.7%	-18.28%	-3.3%
Costa Rica	9	12	23 560	22 046	16 269	0.4%	-1.33%	-26.2%

Paraguay	17	13	8 481	12 000	14 100	0.4%	29.33%	0.0%
El Salvador	14	14	6 743	8 680	8 500	0.2%	22.32%	-2.1%
Panama	15	15	9 550	7 215	3 879	0.1%	-32.36%	-46.2%
Plurinational State of Bolivia	21	16	3 168	3 825	3 720	0.1%	15.23%	0.0%
Dominican Republic	17	17	2 290	2 665	2 680	0.1%	21.55%	0.6%
Argentina	19	18	3 663	2 592	2 085	0.1%	-41.32%	-19.6%
Jamaica	16	19	602	1 151	918	0.0%	47.65%	-20.3%
Uruguay	20	20	200	117	103	0.0%	-86.92%	-12.0%
Surinam	18	21	122	70	37	0.0%	-10.91%	-46.8%
Rest of LAC countries			6 039	2 578	2 432	0.1%	-57.31%	-5.7%
Total LAC			2 665 805	3 517 833	3 755 992	100	23.90%	6.8%

Marine aquaculture production for 2020 is presented in Table 4, which includes coastal aquaculture activities. The latter contributed 32 percent of the total aquaculture production in LAC, with a volume of 1 195 233 tonnes, showing a growth over the period 2019-2020 of 9.32 percent. Shrimps or prawns are the main species cultivated in coastal areas.

Ecuador leads coastal aquaculture production, contributing 63.7 percent of regional production with 760 879 tonnes in 2020, followed by Mexico, which contributes 16 percent with a volume of 190 836 tonnes (Table 4). It is important to note that Mexico has a significant number of aquaculture fisheries, i.e. fisheries based on regular restocking programmes of water bodies with juvenile organisms produced in a controlled manner. This category is not included in FAO statistics as aquaculture.

Coastal aquaculture represents practically 100 percent of Nicaragua's aquaculture production, 98 percent of Ecuador's aquaculture production, and 68.5 percent and 57.3 percent of the total national aquaculture production of Mexico and Panama, respectively (Table 5).

Mariculture in the region has grown at a rate of 6.58 percent between 2019 and 2020, contributing 41.61 percent of total aquaculture production with 1 563 055 tonnes. Mariculture is largely led by Chile, which produced 1 484 761 tonnes, contributing 95 percent of LAC marine production, particularly derived from the production of salmonids and mytilidae. The production achieved by countries like Peru with 47 594 tonnes, Brazil and Mexico with 14 352 and 12 819 tonnes respectively (Table 4) also stands out. Although Peru recorded a decrease in the production of scallops (*Argopecten purpuratus*) with respect to the peaks reached in the previous decade, the industry continues to evolve. In Mexico the production of tuna in ocean floating cages has continued.

Table 4. Aquaculture production by country and inland, coastal and marine production area; growth rate and contribution to regional production by country (aquatic plants excluded)

País	Acuicultura Continental				Acuicultura Marina				Maricultura			
	Producción 2019	Producción 2020	Contribución por país a la acuicultura Continental ALC para el 2020	Tasa de Crecimiento 2019-2020	Producción 2019	Producción 2020	Contribución por país a la acuicultura costera ALC para el 2020	Tasa de Crecimiento 2019-2020	Producción 2019	Producción 2020	Contribución por país al total a la maricultura de ALC para el 2020	Tasa de Crecimiento 2019-2020
Chile	1294	607	0.1%	-53.1%	1586	528	0.0%	-66.7%	1381827	1484761	95.0%	7.4%
Ecuador	15727	13572	1.4%	-13.7%	679985	760879	63.7%	11.9%	78	78	0.0%	0.0%
Brasil	529979	551929	55.3%	4.1%	54336	63170	5.3%	16.3%	15236	14352	0.9%	-5.8%
México	67607	75039	7.5%	11.0%	171924	190836	16.0%	11.0%	11701	12819	0.8%	9.6%
Colombia	165443	173205	17.4%	4.7%	5582	6146	0.5%	10.1%	0	0	0.0%	0.0%
Perú	56948	61003	6.1%	7.1%	50820	35233	2.9%	-30.7%	53511	47594	3.0%	-11.1%
Honduras	36000	38700	3.9%	7.5%	32100	32451	2.7%	1.1%	0	0	0.0%	0.0%
Rep Boliv de Venezuela	4355	4525	0.5%	3.9%	31250	44578	3.7%	42.6%	5	5	0.0%	0.0%
Guatemala	11500	13083	1.3%	13.8%	19500	20568	1.7%	5.5%	0	0	0.0%	0.0%
Nicaragua	10	10	0.0%	0.0%	29490	29400	2.5%	-0.3%	0	0	0.0%	0.0%
Cuba	19226	20326	2.0%	5.7%	6657	4724	0.4%	-29.0%	1218	1150	0.1%	-5.6%
Costa Rica	18777	13377	1.3%	-28.8%	2500	2200	0.2%	-12.0%	769	692	0.0%	-10.0%
Paraguay	12000	14100	1.4%	17.5%	0	0	0.0%	0.0%	0	0	0.0%	0.0%
El Salvador	7502	7377	0.7%	-1.7%	1153	1103	0.1%	-4.3%	25	20	0.0%	-20.0%
Panamá	458	637	0.1%	39.1%	5153	2224	0.2%	-56.8%	1605	1018	0.1%	-36.6%
Bolivia Estado Plurinacional	3825	3720	0.4%	-2.7%	0	0	0.0%	0.0%	0	0	0.0%	0.0%
República Dominicana	1905	1905	0.2%	0.0%	300	300	0.0%	0.0%	460	475	0.0%	3.3%
Argentina	2560	2075	0.2%	-18.9%	0	0	0.0%	0.0%	33	9	0.0%	0.0%
Jamaica	1151	917	0.1%	-20.4%	0	0	0.0%	0.0%	0	1	0.0%	0.0%
Uruguay	117	103	0.0%	-12.0%	0	0	0.0%	0.0%	0	0	0.0%	0.0%
Suriname	55	22	0.0%	-59.6%	15	15	0.0%	0.0%	0	0	0.0%	0.0%
Total LAC	958001	997704		4.14%	1093305	1195233		9.32%	1466527	1563055		6.58%

In Chile, mariculture accounts for almost 100 percent of its national aquaculture production, while in Peru and Panama it accounts for 33 percent and 26 percent, respectively.

Inland aquaculture contributed 26.6 percent of the total aquaculture production in LAC, with a volume of 997 704 tonnes in 2020 (Table 4). This economic activity has had an average annual growth rate of 4.14 percent in the period from 2019 to 2020, mainly due to the expansion of tilapia farming and, in recent years, of Amazonian fish.

Brazil continues to lead the region's continental aquaculture production, contributing 55.3 percent of production with 551,000 tonnes, followed by Colombia with 173,000 tonnes, both countries accounting for 72.7 percent of continental aquaculture. Mexico and Peru follow with 7.5 percent and 6.1 percent, respectively. The growth of inland aquaculture production in Guatemala, Bolivia, Paraguay, Dominican Republic, Mexico and Colombia from 2010 to 2020 stands out.

Two coastal countries, Jamaica and Uruguay, reported inland aquaculture production as their only source of controlled production of aquatic organisms in 2020, while for Argentina and Colombia it represented almost the entire national aquaculture production with 99.6 and 96.6 percent, respectively. Similarly, inland aquaculture contributed the largest share of total aquaculture production in Brazil, Costa Rica, El Salvador, Jamaica and Uruguay.

LAC has a great diversity of native species that are or may be farmed; however, the most widely distributed and farmed aquaculture species are still alien species. For inland aquaculture it is tilapia and for mariculture it is salmonids, which together account for 70 percent of regional production. Tilapia remains the main species produced in inland waters, accounting for 62 percent of the total regional volume, followed by a group of 19 characins (including pacu -

Piaractus mesopotamicus - and tambaqui - *Colossoma macropomum*), which together account for 24 percent of the total regional production (Figure 2)

Thanks to technological success with some native species, efforts have focused on a smaller number of species. In 2013, 80 percent of freshwater aquaculture production was based on 8 species, while by 2020 only 4 groups of species contribute to more than 80 percent of production (FAO, 2022).

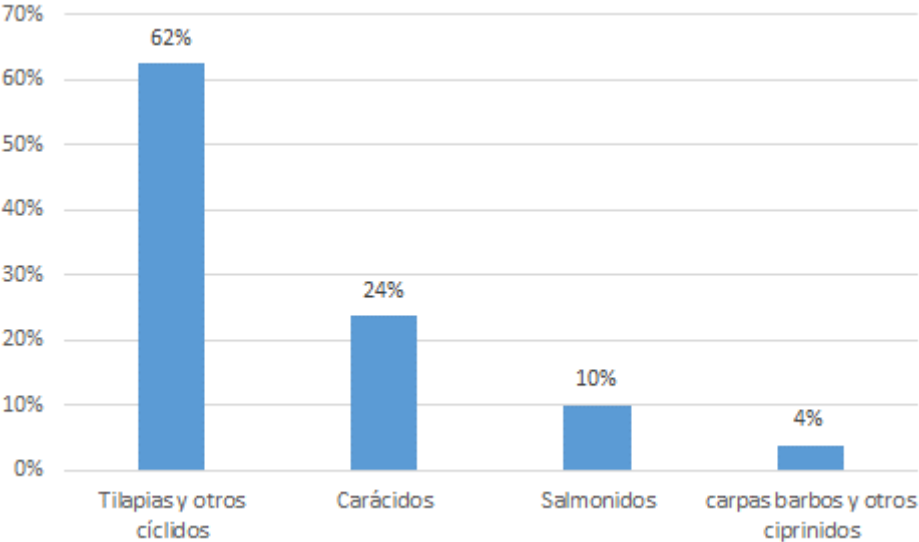


Figure 2. Main inland aquaculture species produced in 2020

Few species have been included in a consolidated way in the freshwater aquaculture spectrum, apart from characins of the Amazon basin. The technological farming consolidation of some non-traditional Amazonian species such as paiche (*Arapaima gigas*) or surubi (*Pseudoplatystoma spp*) has made it possible to maintain a regular supply that can be traded on local markets, particularly in Brazil, Peru and Colombia.

Marine aquaculture production in LAC in 2020 was 44 percent of shrimp (*Penaeidae*), 39 percent of salmon and trout (*Salmo salar*, *Onchorhynchus mykiss*; *O. kisutch*), 15 percent of mussels (*Mytilus chilensis*) and 2.4 percent of scallops (*Argopecten*). These species account for 98 percent of marine production in LAC (Figure 3).

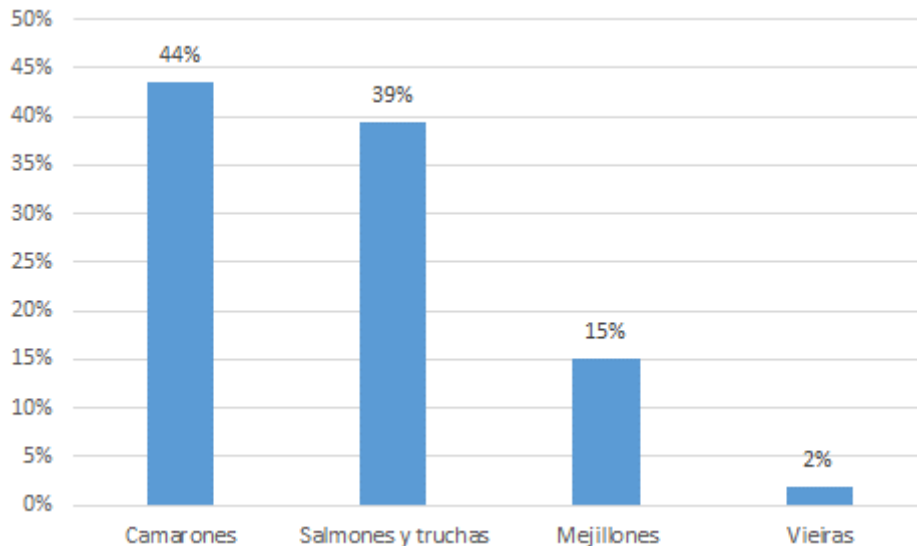


Figure 3. Main groups of marine aquaculture species produced in 2020

Although aquaculture diversification continues to be encouraged by some governments, production is concentrated in the four groups shown in Figure 3, reflecting a greater interest in species that are commercially validated and have established markets. However, there is still incipient but sustained and growing production of some emerging species such as cobia (*Rachycentrum canadum*), even though it is only commercially produced by a company in Panama. The export of this species represents an important technological milestone for the region, in view of previous failed efforts to master the species farming in a profitable way. Likewise, in Chile, the farming of *Seriola lalandi* is emerging as a new opportunity for the diversification of Chilean mariculture, which can be expanded to other countries where this is a native species. On the other hand, despite the potential bivalve mollusc farming in large areas of the region, this activity of low environmental impact and highly profitable only flourishes occasionally in some areas of Costa Rica, Peru, Chile, Brazil and Mexico.

According to official records, aquaculture provides direct employment for approximately 400 000 people, more than 90 percent of whom are men. It is estimated that indirect jobs generated by the activity amount to 1.2 million people.

Aquaculture of limited resources (AREL) and micro and small enterprises (AMyPE) contribute significantly to the food security of rural communities where their production units are located. Many of the producers are also engaged in complementary agricultural activities.

Some challenges:

- Lack of policies to create an enabling environment for the sustainable development of AREL and AMyPE, particularly in a context of historically low competitiveness and low demand due to the pandemic.
- Few countries have analyses of sectoral vulnerability to climate change as the basis to develop national adaptation strategies.
- Few national aquaculture development plans have resources for their implementation.
- Weak integration of AMyPE in value chains with national or international coverage.
- - Low productivity and competitiveness of small producers leads to dependence on external agents for their sustainability.

- Incipient or non-existent aquaculture extension systems in countries, due to low prioritisation and budget.

Conclusions

- Aquaculture has grown steadily in LAC compared to most regions of the world; however, in recent years this trend has slowed down. When analysing by sub-region, only the Caribbean shows a decline in aquaculture production.
- The value of aquaculture production in the region is relatively higher compared to other regions of the world, due to most of the regional production corresponds to species of high commercial value and is exported.
- Industrial aquaculture reflects a higher concentration of assets, with fewer large-scale production units, but higher production in absolute terms. On the other hand, the expansion of small- and medium-scale aquaculture has maintained a steady pace.
- Marine aquaculture dominates total aquaculture production in the region, with the highest annual growth rates in both saltwater and mariculture production.
- Despite the great diversity of native inland and marine species in LAC, few species contribute to most of the production; among these are two alien groups (salmonids and tilapia).
- In marine aquaculture, salmonid, shrimp and mussel farming prevail, although other species of commercial interest are beginning to appear, such as oysters, seaweed and fish for mariculture, such as red drum and seriola.
- Aquaculture is presented as the alternative to satisfy the increasing demand for protein derived from aquatic systems and will continue to grow in the region and the world.
- The growing demand for fish and other aquatic food is causing a rapid change in the fisheries and aquaculture sector. Global consumption is expected to increase by 15 percent and reach 21.4 kg per capita by 2030, driven mainly by rising incomes and urbanisation, changes in post-harvest practices and distribution, and new dietary trends, with a focus on better health and nutrition.
- It is necessary to establish policies for sustainable and responsible growth of the activity, and strengthen the market within the region, to ensure that the demand for fishery and aquaculture products is met with regional products, thus promoting sustainable aquaculture food systems.
- In contrast, the greatest challenges for the regional aquaculture activity will continue to be the emergence of new diseases and the direct or collateral effects of climate change on farming areas, species and systems, in particular an increase in the presence of pathogens and harmful algal blooms in areas of farming influence.
- In terms of social protection, it should be noted that in some Mesoamerican countries, the common factor in the incorporation of artisanal fishers and small-scale fish farmers

into social security systems continues to be the exclusion of men and women who work in this sector, which increases the economic vulnerability of their families in the face of constant exposure to environmental degradation, disturbances (including anthropogenic ones), natural disasters and the COVID-19 pandemic.

- The formal absence of small-scale fisheries and aquaculture in labour codes prevents the risks of fishing and aquaculture activities from being visible and differentiated.
- The vulnerability of small-scale fishing and aquaculture workers due to the lack of access to social protection is aggravated by climate change, which requires technical adaptations for catching, adding value to compensate for the decrease in income or diversification of livelihoods in some fishing and aquaculture communities.
- It is necessary to introduce technical innovation programmes to adapt to the new climate scenarios, through "climate-smart aquaculture". It is also essential to step-up efforts in the development of aquaculture feeds based on alternative and locally available inputs, to ensure both environmental and AREL (Aquaculture Resource Limited Livelihoods) sustainability.