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COMMISSION OF SMALL SCALE, ARTISANAL FISHERIES AND AQUACULTURE OF LATIN AMERICA AND THE CARIBBEAN

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OVERVIEW OF AQUACULTURE IN THE COPPESAALC COUNTRIES

Introduction

This document provides a synthesis of the current situation of aquaculture in Latin America and the Caribbean (LAC), as part of the background information for the sector analysis in the framework of the Seventeenth Session of COPESAALC. The main sources of information used for the elaboration of this document were the FAO biennial publication The State of World Fisheries and Aquaculture 2020[1], the FishstatJ[2] database and the Regional Report for Latin America and the Caribbean on the State and Trends of Aquaculture-2020 (FAO, 2020).

Total Aquaculture Production in LAC in the biennium 2018-2019

In 2019, aquaculture in the LAC region produced a total of 3.5 million tons of food products (excluding seaweed production). Aquaculture contributed with 22.1 percent of the region's total fishery production (fisheries and aquaculture), showing an upward trend (Figure 1). During the last decade, aquaculture production has slowed down from an average annual growth of 8.3 percent in the decade 2000-2010 to an average annual growth of 7.3 percent in the decade 2010-2019. In the last five years, this indicator of expansion of the activity has declined to 4.6 percent per year on average.

[1]FAO.2020. The State of World Fisheries and Aquaculture 2020. Sustainability in action. Rome https://doi.org/10.4060/ca9229es http://www.fao.org/fishery/sofia/es

[2]FAO. 2021. Fishery and Aquaculture Statistics. Global production by production source 1950-2019 (FishstatJ). In: FAO Fisheries Division [online]. Rome. Updated 2021. www.fao.org/fishery/statistics/software/fishstatj/en

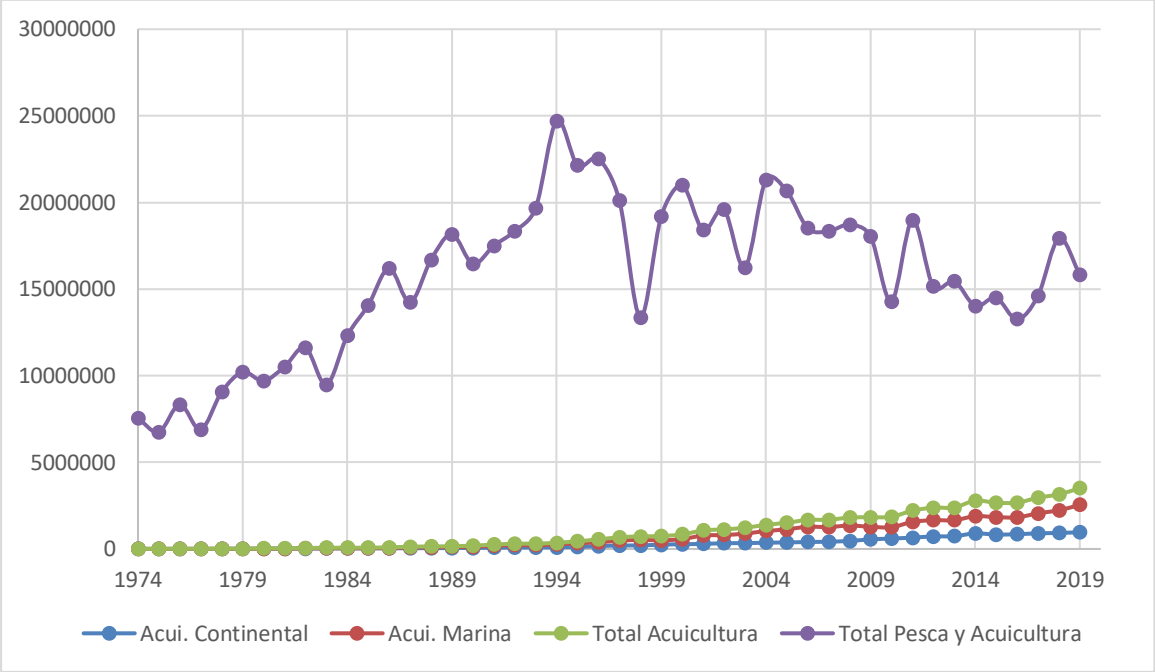

Figure 1. Total aquaculture production in LAC in the period 1974 to 2018 (FAO-FISHSTAT, 2021)

There are clear sub-regional asymmetries in the region in terms of development and consequently aquaculture production. Of the total aquaculture production in LAC, South America contributed 87 percent in 2019, Central America 11.9 percent and the Caribbean 0.9 percent. Globally and in the same order, these sub-regions contributed 3.6, 0.5 and 0.04 percent of global aquaculture production (Table 1).

Table 1. Volume of aquaculture production per LAC sub-region for the years 2015, 2018 and 2019; its contribution to global and LAC production and growth rate for the period 2015 to 2019 (excluding aquatic plants)

Subregion	2015	2018	2019	Contribution to LAC aquaculture for 2019 (%)	Contribution to global aquaculture 2019 (%)	Growth rate 2015-2019
Caribbean	36 365	34 661	32 939	0.94	0.04	-10.40
Central America	357 498	410 403	419 137	11.97	0.50	14.71
South America	2 271 761	2 694 919	3 049 947	87.09	3.60	25.51
Total LAC	2 665 624	3 139 634	3 502 023	100	4.14	23.88
Global Total	72 778 145	82 095 054	84 687 576			14.06

The reported value of regional aquaculture production in 2019 was USD 17.6 billion, representing 6.8 percent of the global value of aquaculture products. The production value in LAC for the period 2010 to 2019 increased 8.8 percent. By sub-region, in South America, Central America and the Caribbean the production value increased 8.9, 8.2 and (-0.67) percent, respectively. In the region, the relative average value of aquaculture (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 per volume and region, 2000-2019 (excluding aquatic plants)

Subregion	2000	2010	2019	Contribution to LAC production, 2019 (%)	Contribution to global aquaculture 2019 (%)	Annual growth rate (%)	Relative value 2018 (USD/Kg)
Caribbean	58 618	66 195	62 333	0.35	0.02	-0.67	1.82
Central America	383 291	871 928	1 779 010	10.06	0.68	8.25	4.23
South America	2 206 372	7 323 943	15 844 746	89.58	6.10	8.95	5.20
Total LAC	**2 648 281**	**8 262 065**	**17 688 108**	**100.00**	**6.81**	**8.83**	**5.05**
Global Total	**47 796 466**	**131 214 611**	**259 775 904**			**7.88**	**3.16**

Aquaculture production in LAC is dominated by Chile, Ecuador and Brazil, which contributed 76.5 percent to total regional production in 2019. Chile is the main producer contributing 39.5 percent (Table 3). The aforementioned countries, together with Mexico, Colombia and Peru, account for 93 percent of the region's aquaculture production. Some countries such as Honduras, Guatemala and Nicaragua have increased their production, placing them among the top 10 producing countries in LAC.

Table 3. Aquaculture production and country contribution to the LAC region; growth rate for the periods 2015 to 2019 and 2018 to 2019 (excluding aquatic plants)

	Posición		Producción (toneladas)			Contribución a la produccion 2019 (%)		Tasa de crecimiento (%)	
País	2000	2019	2015	2018	2019	ALC	Mundo	2015-2019	2018-2019
Chile	1	1	1 045 790	1 266 054	1 384 704	39.5	1.69	24.48	8.57
Ecuador	2	2	426 710	581 390	695 790	19.9	0.85	38.67	16.44
Brasil	3	3	577 643	580 888	599 551	17.1	0.73	3.65	3.11
México	4	4	211 562	247 192	251 232	7.2	0.31	15.79	1.61
Colombia	6	5	9 5857	132 756	171 025	4.9	0.21	43.95	22.38
Perú	5	6	9 0975	103 597	153 940	4.4	0.19	40.90	32.70
Honduras	8	7	55 100	65 000	68 100	1.9	0.08	19.09	4.55
Guatemala	12	8	22 248	28 317	30 600	0.9	0.04	27.29	7.46
Nicaragua	11	9	24 536	29 468	29 500	0.8	0.04	16.83	0.11
Cuba	7	10	32 056	28 628	27 101	0.8	0.03	-18.28	-5.63
Rep. Boliv. '	10	11	18 911	25 810	26 360	0.8	0.03	28.26	2.09
Costa Rica	9	12	23 560	23 160	23 250	0.7	0.03	-1.33	0.39
Paraguay	17	13	8 481	11 536	12 000	0.3	0.01	29.33	3.87
El Salvador	14	14	6 743	8 600	8 680	0.2	0.01	22.32	0.92
Panamá	15	15	9 550	8 826	7 215	0.2	0.01	-32.36	-22.33
Bolivia	21	16	2 988	3 500	3 525	0.1	0	15.23	0.71
República I	17	17	2 290	2 819	2 919	0.1	0	21.55	3.43
Argentina	19	18	3 663	3 206	2 592	0.1	0	-41.32	-23.69
Jamaica	16	20	602	1 616	1 150	0	0	47.65	-40.52
Suriname	18	22	122	110	110	0	0	-10.91	0.00
Uruguay	20	23	200	102	107	0	0	-86.92	4.67
Resto de paises			6 037	449	554	0.1	0	-134.63	4.12
Total ALC			**2 665 624**	**3 155 042**	**3 502 023**		**4.14**	**23.90**	**9.91**
Total mundial			**72 778 145**	**82 153 863**	**84 687 576**			**14.10**	**2.99**

Table 4 shows marine aquaculture production in 2019, including coastal farming activities which contributed 31 percent of the total aquaculture production in LAC, accounting for 1 075 255 tonnes, representing an 8.7 percent annual growth in the region. Shrimps or prawns are the main species farmed in coastal areas. Ecuador leads coastal aquaculture production, contributing 63.2 percent of regional production with 679 985 tonnes in 2019, followed by Mexico, which contributes 16 percent of total LAC aquaculture production, with a volume of 1 075 255 tonnes, showing an annual growth in the region of 8.7 percent. Shrimps or prawns are the main species farmed in coastal areas.

Ecuador leads coastal aquaculture production, contributing 63.2 percent of regional production with 679 985 tons in 2019, followed by Mexico, which contributes 16 percent with a volume of 171 924 tons (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 almost a 100 percent of Nicaragua's aquaculture production, 97 percent of Ecuador's aquaculture production, and for Panama and Mexico it represents 71.4 and 68.4 percent respectively of their total national aquaculture production (Table 5).

Mariculture in the region has grown at an average annual rate of 7.8 percent since 2010, contributing 41.9 percent of total aquaculture production with 1 467 784 tons. Mariculture is largely led by Chile, which produced 1 383 394 tons, accounting for 94.3 percent of LAC production, mainly from salmonids and Mytilidae production. The production of Peru with 53 511 tons, Brazil and Mexico with 15 236 and 11 701 tons, respectively, also stands out (Table 4). Although Peru shows a decline in the production of scallops (*Argopecten purpuratus*) compared to the peaks reached in the previous decade, the industry continues to evolve. In Mexico, the continuity in the production of tuna in floating oceanic cages excels.

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

	Acuicultura continental				Acuicultura marina							
					Acuicultura costera				Maricultura			
País	Producción 2018 (toneladas)	Producción 2019 (toneladas)	Contribución a la producción en ALC 2019	Tasa crecimiento 2018-2019	Producción 2018 (toneladas)	Producción 2019 (toneladas)	Contribución a la producción en ALC 2019	Tasa crecimiento 2018-2019	Producción 2018 (toneladas)	Producción 2019 (toneladas)	Contribución a la producción en ALC 2019	Tasa crecimiento 2018-2019
Chile	874	1 291	0.13	32.30	10	19	0.00	47.37	1 265 170	1 383 394	94.25	8.55
Ecuador	21 340	15 727	1.64	-35.69	560 000	679 985	63.24	17.65	50	78	0.01	35.90
Brasil	52 0915	529 979	55.26	1.71	45 750	54 336	5.05	15.80	14 222	15 236	1.04	6.66
México	70 197	67 607	7.05	-3.83	161 295	171 924	15.99	6.18	15 700	11 701	0.80	-34.18
Colombia	127 659	165 443	17.25	22.84	5 097	5 582	0.52	8.69	0	0	0.00	0.00
Perú	61 398	56 948	5.94	-7.81	29 717	43 481	4.04	31.66	12 482	53 511	3.65	76.67
Honduras	33 500	36 000	3.75	6.94	31 500	32 100	2.99	1.87	0	0	0.00	0.00
Guatemal	11 044	11 100	1.16	0.50	17 273	19 500	1.81	11.42	0	0	0.00	0.00
Nicaragua	10	10	0.00	0.00	29 458	29 490	2.74	0.11	0	0	0.00	0.00
Cuba	20 968	19 226	2.00	-9.06	6 474	6 657	0.62	2.75	1 186	1 218	0.08	2.63
Bolivia (Es	3500	3 525	0.37	0.71	0	0	0.00	0.00	0	0	0.00	0.00
Costa Rica	19 841	19 881	2.07	0.20	2 700	2 750	0.26	1.82	619	619	0.04	0.00
Paraguay	11 536	12 000	1.25	3.87	0	0	0.00	0.00	0	0	0.00	0.00
El Salvado	7 422	7 502	0.78	1.07	1 153	1 153	0.11	0.00	25	25	0.00	0.00
Panamá	341	458	0.05	25.55	6 409	5 153	0.48	-24.37	2 076	1 604	0.11	-29.43
República	2 119	2 219	0.23	4.51	400	400	0.04	0.00	300	300	0.02	0.00
Argentina	3 192	2 560	0.27	-24.69	0	0	0.00	0.00	14	32	0.00	56.25
Jamaica	1 616	1 150	0.12	-40.52	0	0	0.00	0.00	0	0	0.00	0.00
Suriname	75	75	0.01	0.00	35	35	0.00	0.00	0	0	0.00	0.00
Uruguay	102	107	0.01	4.67	0	0	0.00	0.00	0	0	0.00	0.00
Total ALC	**923 678**	**958 985**	**27.30**	**3.68**	**919 446**	**1 075 255**	**30.7**	**14.49**	**1 311 917**	**1 467 784**	**41.9**	**10.62**

For Chile, mariculture represents almost 100 percent of its national aquaculture production, while for Peru and Panama it represents 34.8 and 22.2 percent, respectively.

Inland aquaculture contributed 27.3 percent of the total aquaculture production in LAC, with a volume of 958 985 tons in 2019 (Table 4). This economic activity has had an average annual growth rate of 5.3 percent in the period from 2000 to 2019, 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 55.2 percent of production with 529 000 tons, followed by Colombia with 165 443 tons. Together, the two countries account for 72.6 percent of inland aquaculture. They are followed by Mexico and Peru with seven and six percent, respectively. The growth of inland aquaculture production in Guatemala, Bolivia, Paraguay, Dominican Republic, Mexico and Colombia since 2010 stands out.

Two coastal countries, Jamaica and Uruguay, reported inland aquaculture production as their only source of controlled production of aquatic organisms in 2019, while for Argentina and Colombia it accounted for almost the entire national aquaculture production with 98.8% and 96.7%, respectively. Similarly, inland aquaculture contributed most of the total aquaculture production in Brazil, Costa Rica and El Salvador.

LAC has a great diversity of farmed native species, being alien species the most widely distributed and farmed ones. 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 grown in inland waters, accounting for 60 percent of the total regional volume, followed by a group of 19 characids (including pacu -*Piaractus mesopotamicus*- and tambaqui -*Colossoma macropomum*-), which together account for 26 percent of the total regional production (Figure 2).

The technological success achieved with some native species has led to efforts being concentrated on a smaller number of species. In 2013, 80 percent of freshwater aquaculture production was based on 8 species, while in 2018 only 4 species contributed with more than 80 percent of production (FAO, 2020b).

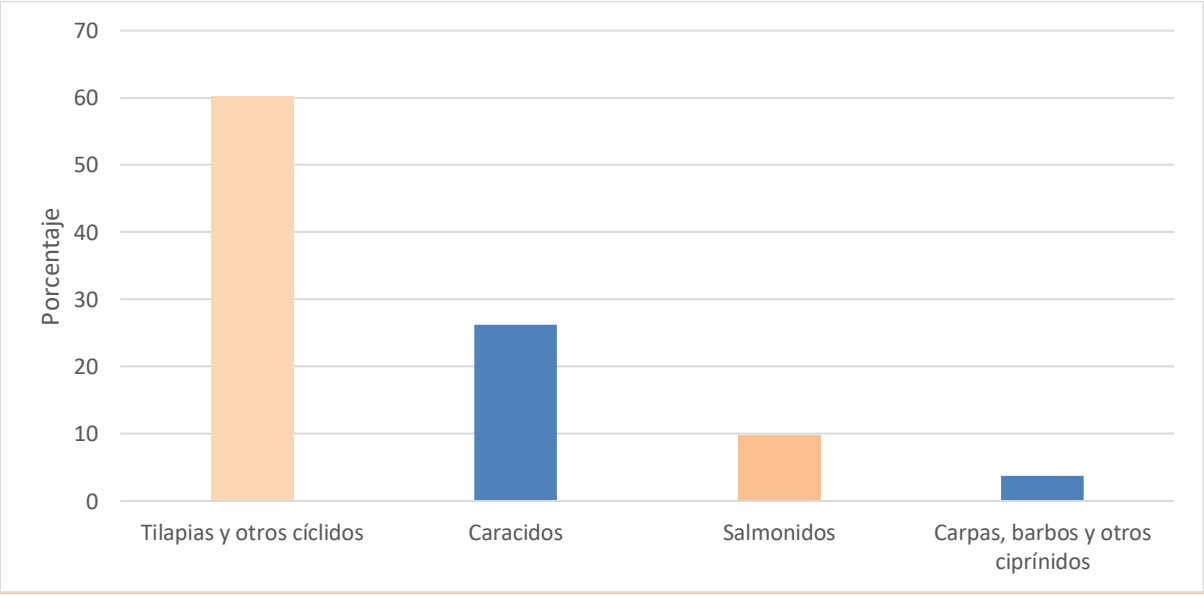

Figure 2. Main inland aquaculture species produced in 2019

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

In 2019, the marine aquaculture production in LAC was equivalent to 42 percent shrimp (*Penaeidae*), 38.8 percent salmon and trout (*Salmo salar, Onchorhynchus mykiss; O. kisutch*), 15 percent mussels (*Mytilus chilensis*) and 2.4 percent scallops (*Argopecten*). These species together account for 98 percent of marine production in LAC. (Figure 3).

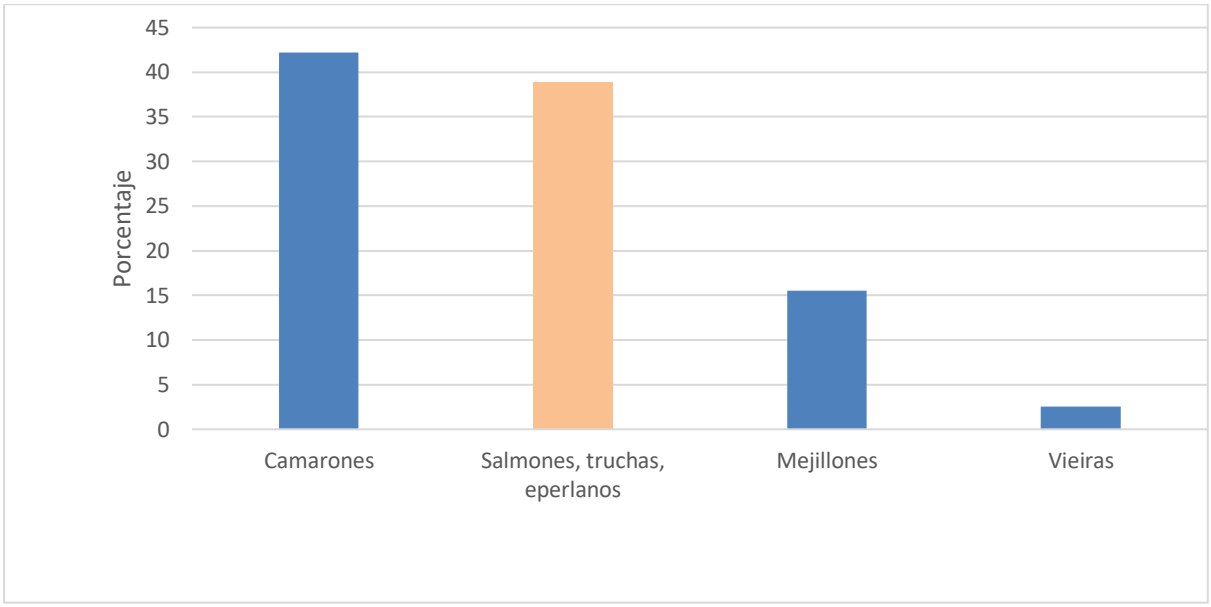

Figure 3. Main groups of marine aquaculture species produced in 2019

Although aquaculture diversification continues to be encouraged by some governments, production concentration in the four groups shown in Figure 3 reflects a greater commitment to commercially validated species with established markets. However, the production of some emerging species such as cobia (*Rachycentrum canadum*) is still incipient but sustained and expanding. Even though it is only commercially produced by one company in Panama, exports of this species represent an important technological milestone for the region, despite previous failure of a profitable farming. On the other hand, despite the bivalve mollusks farming potential of large areas of the region, this activity of low environmental impact and high-income potential only flourishes in some areas of Costa Rica, Peru, Chile, Brazil and Mexico.

According to official records, aquaculture provides direct employment for approximately 400 000 people, of whom more than 90% are men. Indirect employment generated by the activity is estimated at 1.2 million jobs.

The Aquaculture of Limited Resources (AREL) and Aquaculture of Micro and Small Enterprises (AMYPE) contribute significantly to the food security of the rural communities where their production units are located. Many of the producers also carry out other complementary agricultural activities.

Some challenges:

- The absence of policies that promote an enabling environment for the sustainable development of ARELs and AMYPEs, particularly in a context of persistent low competitiveness and demand due to the pandemic.
- Few countries have analyses of vulnerability to climate change as a basis for building national adaptation strategies.
- Few national aquaculture development plans have resources for their implementation.
- Weak integration of AMYPEs in value chains of 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 the countries, due to limited priorities and budgets.

Conclusions

- Aquaculture in LAC maintains a steady growth rate higher than most of the regions in the world; however, in recent years this trend has slowed down. In a close analysis by sub-region, only the Caribbean shows a decrease in aquaculture production.
- The value of aquaculture production in the region is relatively higher than in other regions of the world because 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. The expansion of medium and small-scale aquaculture, on the other hand, remains steady.
- Marine aquaculture accounts for the largest share of total aquaculture production in the region, with the highest annual growth rates in both coastal and mariculture production.
- Despite the great diversity of native inland and marine species in LAC, few species contribute to the majority of production; among them are two alien groups (Salmonidae and tilapia).
- In marine aquaculture, salmonid, shrimp and mussel farming continue to dominate, although other species of commercial interest are beginning to appear, such as oysters, seaweed and fish for mariculture, such as red sea bass.
- Aquaculture is presented as an alternative to satisfy the increasing demand for protein from aquatic systems, which is why it will continue to grow in the region and the world. It is necessary to establish policies that allow for the sustainable and responsible growth of the activity, as well as to strengthen the market within the region, allowing the demand for fishery and aquaculture products to be met with regional products.
- In contrast, the greatest challenges for the regional aquaculture activity will continue to be the outbreak of new diseases and the direct or side effects of climate change on farming areas, species and systems, in particular, an increase of pathogens and harmful algal blooms in areas of farming influence.
- It is necessary to incorporate technological innovation programmes to adapt to new climate scenarios, through "climate-smart aquaculture". It is also essential to double efforts in the development of aquaculture food based on alternative and locally available inputs, to ensure environmental and Aquaculture Resource-Limited Aquaculture (AREL) sustainability.