

CONTRIBUTIONS TO THE SUSTAINABILITY OF ARTISANAL FISHING

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ABSTRACT

Commercial artisanal and subsistence fishing is a fundamental productive activity to guarantee the right to food and the local economy of marine and coastal fishermen, which is threatened by climate change, pollution and overfishing impacts. These environmental impacts accentuate the social protection needs of artisanal fishing communities, such as the variability and precariousness of income and the lack of access to the social security system. Considering the above, this article analyzes the social protection needs of artisanal fishermen from a methodological approach of socioecological analysis called “press-pulse dynamics” of fishing productive activity, based on the study of Bill no. 38 of 2020, “through which rules are issued to ensure specific social benefits to commercial artisanal and subsistence fishermen”, submitted to the House of Representatives of the Congress of the Republic of Colombia. Based on this methodology, a number of guidelines are proposed for the formulation of regulations in the fishing

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sector, as well as participatory policies and legal frameworks that can contribute to the sustainability of artisanal fisheries in Latin America and the Caribbean.

Keywords: artisanal fishermen; artisanal fishing; climate change; right to food; social protection.

RESUMO

A pesca artesanal comercial e de subsistência é uma atividade produtiva fundamental para garantir o direito à alimentação e à economia local dos pescadores marinhos e costeiros que se encontra ameaçada pelos impactos das mudanças climáticas, da poluição e da sobrepesca. Esses impactos ambientais acentuam as necessidades de proteção social das comunidades pesqueiras artesanais, tais como a variabilidade e precariedade dos lucros e a falta de acesso ao sistema de segurança social. Considerando o exposto, este artigo analisa as necessidades de proteção social dos pescadores artesanais a partir de uma abordagem metodológica de análise socioecológica denominada “pressões e tensões” da atividade produtiva da pesca, com base no estudo do Projeto de Lei n. 38 de 2020, “por meio do qual são emitidas regras para assegurar benefícios sociais específicos aos pescadores artesanais comerciais e de subsistência”, submetido à Câmara dos Representantes do Congresso da República da Colômbia. Com base nessa metodologia, é proposta uma série de diretrizes para a formulação de regulamentos no setor pesqueiro, assim como políticas participativas e marcos jurídicos que possam contribuir para a sustentabilidade da pesca artesanal na América Latina e no Caribe.

Palavras-chave: direito à alimentação; mudança climática; pesca artesanal; pescadores artesanais; proteção social.

INTRODUCTION

Commercial artisanal and subsistence fishing is a traditional activity carried out using fishing methods or tools with little technological development, which provides a large part of the products for direct consumption in Latin America and the Caribbean. It is estimated that a large part of the unpreserved fish consumed in the region comes from artisanal and subsistence fisheries. However, fishing is an activity that is highly threatened by the impacts of climate change, pollution and the overexploitation of fisheries resources.

Climate change in the marine and coastal areas of the region has led to changes in the reproductive behavior of fish, rising sea levels, declining catches, and variability in ocean temperature. In continental areas, climate change has intensified droughts and floods, which negatively affect the growth and reproduction of species of commercial interest and direct consumption in rivers, as well as water quality.

It has been proven that the increase in temperature, as a consequence of climate change, has caused the migration of species to colder waters, reducing fish populations, affecting fishing and, therefore, the economy of coastal and riverside regions.

Because of such impacts on fisheries resources, changes have been observed in the duration of fishing activities, in the size of the mesh opening and in the implementation of illegal practices such as the use of substances harmful to fisheries, like cyanide, or explosives, like dynamite⁴. These changes can have negative long-term consequences, which intensify the social protection needs of artisanal fishing communities.

These social protection needs include the variability and precariousness of fishermen's income, inadequate working conditions, lack of access to the social security system, health risks, social protection distinctions based on gender, and difficulties in accessing participation in decisions related to the fishing sector.

Considering the above, the objective of this article is to analyze the social protection needs of artisanal fishermen from a methodological approach of socioecological analysis called "press-pulse dynamics" of the fishing productive activity, based on the study of Bill no. 38 of 2020, "through which rules are issued to ensure social benefits aimed

⁴ Complaints were filed in Colombia about the use of dynamite for artisanal fishing in the Corales del Rosario e San Bernardo National Natural Park, in the city of Cartagena, Department of Bolívar, which affects marine ecosystems and, therefore, the fishing resources of these communities.

at commercial artisanal and subsistence fishermen”, submitted to the Chamber of Deputies of the Congress of the Republic of Colombia. Based on this methodology, a number of guidelines are proposed for formulating regulations in the fisheries sector, as well as participatory policies and legal frameworks that can contribute to the sustainability of artisanal fisheries in Latin America and the Caribbean.

1 SOCIAL PROTECTION NEEDS OF ARTISANAL AND SUBSISTENCE FISHERMEN

Regarding the social protection of artisanal and subsistence fishermen, it should be noted that, in general, these communities are in a highly vulnerable situation, given their limited access to public services and the variability of their income. According to data from the third national agricultural census, 68.8% of the total number of peasant families who reported fishing activities in Colombia live in poverty, according to the country’s Multidimensional Poverty Index (MPI). The calculation is made considering different indicators related to health, access to water and sewage services, education and housing conditions (DANE, 2014).

With regard to water and sewage services, the Socioeconomic Report of artisanal fishermen in the basins and coastal areas of Colombia confirms that artisanal fishermen live in housing with high levels of unmet basic needs (UBN) and low coverage of basic domestic services (GONZÁLEZ PORTO; RIVERA; MANJARRÉS-MARTÍNEZ, 2015).

Table 1 shows the distribution of coverage of domestic services and unmet basic needs in the homes of fishermen interviewed in a coastal city in Colombia in 2015 (GONZÁLEZ PORTO; RIVERA; MANJARRÉS-MARTÍNEZ, 2015):

Table 1. Coverage of domestic services and unmet basic needs in fishermen’s homes

Service	Dwellings	Roof (%)	Percentage
Aqueduct	19	0.3	99.7
Electricity	2939	41.2	58.7
Natural gas	1726	24.2	75.8
Septic tank	64	0.9	99.1
Garbage collection	1859	26.1	73.9
Sewerage system	4	0.1	99.9
Telephone	514	7.2	92.8

Source: González Porto, Rivera and Manjarrés-Martínez (2015).

On the other hand, it was identified that the income variability of artisanal fishing communities is related to the seasonality of fishing, due to the closed season and reproduction of the species, and the lack of infrastructure and cold storage of fish. This generates fishermen's high dependence on intermediaries or product processors and, therefore, intensifies the precariousness of their income (see figures 1 and 2) (FAO, 2016).

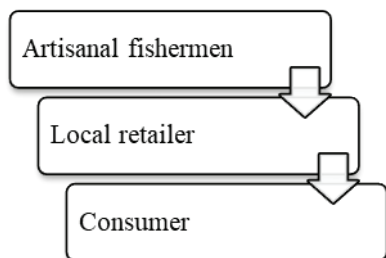


Figure 1. Commercialization of fishing for local supply, specific to municipalities with fish landing ports.

Source: adapted from González Porto, Rangel-Durán and Manjarrés-Martínez (2020).

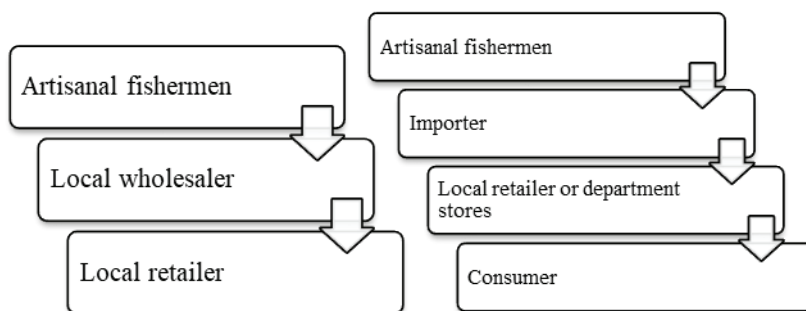


Figure 2. Commercialization of fishing for local supply, specific to municipalities far from the fish landing ports.

Source: adapted from González Porto, Rangel-Durán and Manjarrés-Martínez (2020).

With regard to inadequate working conditions, the difficulty in complying with minimum work standards in artisanal and subsistence fisheries is mainly due to the prevalence of informality. Fishing operations often lack safety equipment in case of accidents, adequate rest periods or a minimum wage. Such a situation increases the risks of accidents at work and the vulnerability of artisanal and subsistence fishing communities (FAO, 2019).

The formalization of the fishing activity before the National Authority for Aquaculture and Fisheries (AUNAP) in Colombia is based on the issuance of a fisherman’s card. Of the 7125 fishermen surveyed in the 2015 Socioeconomic Report, only 2651 (37.21%) have an AUNAP registration card (see Table 2).

Table 2. Distribution of artisanal fishermen with meat issued by AUNAP to certify fisherman status

Basin or Coast	Registered with AUNAP	No AUNAP registration	Percentage
Amazônia	48	29	77
Atrato	14	172	186
Caribe	984	1100	2084
Magdalena	1040	2499	3539
Orinoquia	114	68	182
Pacífico	442	265	707
Sinú	9	341	350
Grand total	2651	4474	7125
Percentage	37.2	62.8	100

Source: González Porto, Rivera and Manjarrés-Martínez (2015).

In terms of the health risks associated with artisanal and subsistence fishing, the level of access to health services is considerably low (GONZÁLEZ PORTO; RIVERA; MANJARRÉS-MARTÍNEZ, 2015). This is a worrying situation, considering the vulnerability of artisanal fishermen to diseases and accidents, exposure to extreme temperatures, fires due to overheating engines and handling of harpoons, knives and hooks (FAO, 2019) .

Among the factors that produce this high rate of accidents in fishing are the time spent fishing, vessels’ size, and failure to comply with safety regulations. Added to the above is the informality of artisanal fishing and the increase in extreme weather events, such as storms and floods, as a result of climate change (ROJAS HIGUERA; PABÓN CAICEDO, 2015).

Regarding social protection distinctions based on gender, it was found that in the fisheries sector, men and women have been involved in different and complementary activities, which are highly influenced by the territory’s social, cultural and economic context (FAO, 2017). In most regions, fishing is an activity generally performed by men. The manufacture, net mending,

processing and marketing, as well as the capture of species such as the *piangua* – *Anadara tuberculosa* *Anadara similis* – in the Pacific are mainly carried out by women (FAO, 2017).

In fact, the Socioeconomic Report on Inland and Marine Artisanal Fisheries in Colombia shows that out of a total of 7,125 fishermen surveyed, 6,753 are male and 372 are female, ignoring activities such as manufacturing, net mending, processing, marketing, and catching of some species by women.

Table 3. Distribution of the fishing population by gender and age.

Age	Male	Female	Total	Percentage
10-14	13	0	13	0.2
15-19	156	6	162	2.3
20-24	417	21	438	6.2
25-29	625	17	642	9.0
30-34	732	45	777	10.9
35-39	767	42	809	11.4
40-44	849	49	898	12.6
45-49	806	57	863	12.1
50-54	729	41	770	10.8
55-59	665	39	704	9.9
60-64	468	26	494	6.9
65-69	288	15	303	4.3
70-74	145	5	150	2.1
75-79	68	6	74	1.0
80-84	21	two	23	0.3
85 and over	4	1	5	0.1
Total	6753	372	7125	100.0

Source: González Porto, Rivera and Manjarrés-Martínez (2015).

Finally, the lack of participation in decision-making processes makes it necessary, in the fishing sector, to promote the participation of communities and fishermen in fishing policies and in the management of coastal and riverside areas, as an action consistent with the social and democratic rule of law, and governance in fishing activities. Thus, it is possible to integrate the traditional knowledge of artisanal and subsistence fishermen into

fisheries sector policies and implement these measures more effectively, without ignoring the needs and the specific context of the activity.

In response to the social protection needs of the commercial artisanal and subsistence fishing sector described above, the Chamber of Deputies of the Congress of the Republic of Colombia presented Bill no. 38 of 2020 “Under which rules are issued to ensure targeted social benefits to commercial and subsistence artisanal fishermen”, with the aim of improving artisanal fishermen’s productive conditions through targeted social benefits.

In order to contribute to the regulation proposed by this corporation, and to outline a roadmap on the issue – in line with the protection of food rights, food security and food sovereignty – we analyzed and suggested elements to be taken into account in the bill. To carry out such analysis and prospective, the methodology of socioecological analysis “press-pulse dynamics” of the productive activity of fishing is used (COLLINS *et al.*, 2010), with the objective of analyzing the relationship between the social and ecological components of artisanal fisheries (see Figure 3) and proposing a series of elements to be considered in the regulation of social benefits for commercial artisanal and subsistence fishermen in the region.

This article uses the “press-pulse dynamics” methodology (COLLINS *et al.*, 2010). of socioecological analysis. The objective is to specify the situations in which interactions occur between the social, legal and institutional component and the ecological and biological component in the artisanal fishing activity, in order to identify the specific social protection needs of fisheries communities and propose a number of elements to be considered in the regulation of social benefits for artisanal commercial and subsistence fishermen.

As for the methodology, it is necessary to specify that fishing resources and productive fishing activities are part of complex socio-ecological systems. Such systems are composed of different variables that affect each other and that are strongly linked to social, economic and political aspects, as well as to other elements that interact in different temporal and spatial scales (OSTROM, 2009). Given the complexity in the number and nature of the variables that make up a socioecological system, the management of an exploited natural resource requires the integration of the system’s biology and ecology with the socioeconomic and institutional factors that affect the behavior of fishermen and fishing communities and those responsible for management and administration (DEFEO, 2015).

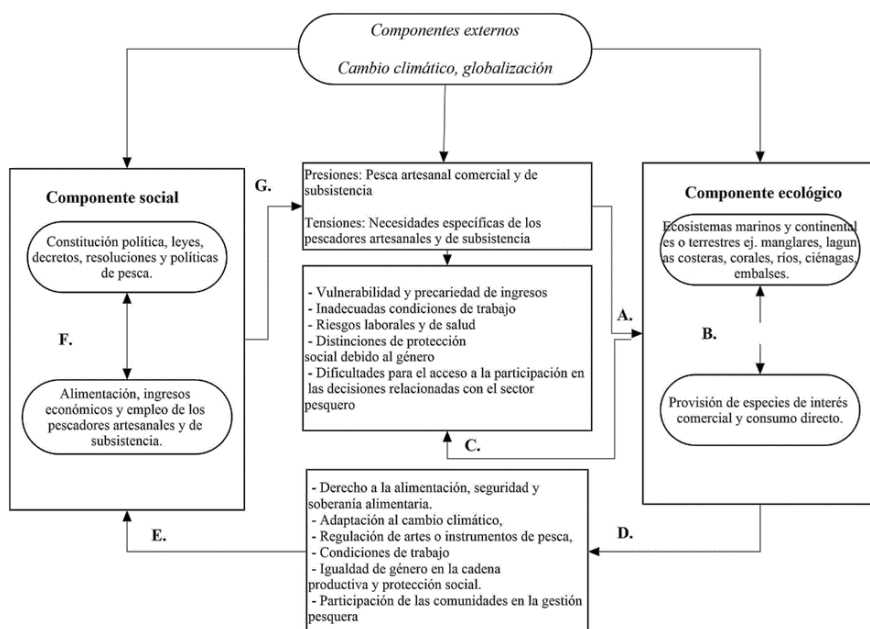


Figure 3. Methodology for socioecological analysis of commercial and subsistence artisanal fisheries' productive activity.

Source: adapted from FAO (2019).

Items A-G refer to the assumptions in which interactions between the social, legal and institutional component and the ecological and biological component occur in artisanal fishing activity. Item A refers to fishing practices and the use of fisheries resources by artisanal commercial and subsistence fishermen, such as the use of non-selective fishing gear or increased fishing effort. Item B refers to the relationship between fishing practices and the capacity of ecosystems to provide species of commercial interest and direct consumption. Item C refers to the long-term consequences of inappropriate fishing practices, which intensify the climate change impacts and the specific social protection needs of fishing communities. Item D refers to the effects of good fishing practices on the socioeconomic component, such as guaranteeing the right to adequate food, food security and sovereignty, climate change adaptation and participation of fishing communities in decisions that affect them. Item E refers to the strengthening of the social components related to food, economic income and employment of artisanal and subsistence fishermen. F refers to the regulatory system for the fishing sector: Political Constitution, laws, decrees, resolutions and policies, programs, plans and projects. And

item G to the regulation of artisanal and subsistence fishing practices and operations in the country's regulatory system and the implications of regulation on the use and management of fisheries resources.

Following this methodology and in order to analyze the relationship between these components, it is important to consider that the use of fishing gear determines the method of extraction and exploitation of the fishery resource (Item A). Thus, in the analysis of the impact of the use of fishing gear and techniques for fishing activities of a fishing population in Colombia, it was found that the product obtained through the use of trammels⁵, represented more money during the sale, despite being formed, in most cases, by small species; however, the prices assigned to these species are easily delivered (corresponding to 5 fish), in such a way that the profit obtained varies according to the catch volume. While in fishing operations using the cast net⁶, with which the fish caught was larger in size and therefore of greater economic value, low volumes of catch are reported, equivalent to lower gains per catch (BENAVIDES PIZA; HERNÁNDEZ DURÁN, 2014).

However, when analyzing the sample of catches by activity, it was found that the fishing technique using the cast net method is more selective than the fishing technique using trammels, since, in the case of the cast net, the capture of one species was observed, while for fishermen who used trammels, the average catch was four species per fishery. Likewise, a lower catch per unit of fish was found with the use of trammel, with an average ratio of 5 to 1 units per fishing trip, between the two techniques (BENAVIDES PIZA; HERNÁNDEZ DURÁN, 2014).

This demonstrates that, with non-selective fishing gear, the species caught do not reach the development stage, which has an impact on fish stocks and a decrease in the catch size (Item B). On the other hand, fisheries resources are determined by changes in oceanographic and climatic conditions that can affect both the marine and continental environments, producing changes in temperature, migrations away from fishing grounds and declines in fish populations.

These consequences affect the stability of fisheries resources through

5 A gillnet or trammel net catches fish that enter the net. It has stoppers at the top and weights at the bottom. The net panels stand in the water like a fence and capture the fish by the gills (AUNAP, 2014a).

6 A cast net is a round net with weights around its circumference and a line attached to the inside of the circle, which is thrown from the bank to drag fish that approach the beach or river bank. There are triangular shaped trawls that form a pyramid with a line attached to the top of the pyramid (AUNAP, 2014a).

changes in the productivity of ecosystems and a decrease in the size of catches of the species, creating difficulties in accessing fisheries resources and a decrease in the fishermen's economic income (Item C).

From these environmental impacts it can be concluded that, due to changes in distribution, species composition and habitats, it is necessary to modify the artisanal fishermen's practices and working conditions in aspects such as fishing gear and methods, processing facilities and marketing and social protection to ensure the availability of fisheries resources, the right to food for fishing and coastal communities, climate change adaptation, and access to social security for artisanal and subsistence fishermen (Item D-Item E).

Of course, the existence of rules and regulations on the availability of fishing resources, the right to food, climate change adaptation and access to the social security system for the artisanal and subsistence fishing sector, which articulates environmental conservation and social needs of the sector, is essential to develop policies and strategies for a sustainable food system, as part of the necessary efforts to end hunger and all forms of malnutrition in Latin America and the Caribbean (Item F).

For the case of Colombia, and following the methodology described above, an analysis is made of general and sectoral regulations for artisanal and subsistence fishing on the variables of social security, right to food, and climate change adaptation (Item G) .

Table 4. Analysis of general and sectoral regulations for fisheries in Colombia.

Year	Regulation (Laws, Decrees and Public Policies)	Entity	Description of Social Security/Food Security/Gender/Climate Change variables
1971	CONPES 832 Application by Vikingos de Colombia S.A. for eligibility of fish and fish processing for export and domestic sale for investment in economic development reserve	National Department of Planning (DNP) of Colombia	On the initiative of the private company, Pesquera Vikingos de Colombia S.A., it was sought to support fisheries within the national industry, where the DNP considered the importance of fishing in the country's economy, as a generator of jobs and foreign exchange, and recommended that it be included in the Extraordinary Reserve for Economic Development. As it is the first national policy, it does not have strategies that develop the proposed variables (CONPES, 1971).
1975	CONPES 1313. Opinion of the National Planning Department to the National Council for Economic and Social Policy on an external credit operation planned by INDERENA to finance the inland fisheries and aquaculture development plan	National Department of Planning (DNP) of Colombia	The Policy sought to generate credits to finance the Inland Fisheries and Aquaculture Development Plan, through which the following objectives would be achieved: (i.) research in this field, (ii.) increased production and consumption of freshwater fish, creation of new sources of work that would increase the less favored population's income, (iii.) training of human resources in the processing and management of fish. This policy does not develop any of the variables mentioned above (CONPES, 1975)
1981	CONPES 1821 Basis for the indicative plan for industrial fishing, Law	National Department of Planning (DNP) of Colombia	The main objective of the plan was to achieve an adequate development of the national fishing industry. This policy makes no mention of the variables raised (CONPES, 1981).
1990	Law 13 of 1990	Congress of the Republic of Colombia	This law gives the Ministry of Agriculture and Rural Development (MADR) central responsibility for formulating public policies for the sector and creates the National Institute of Fisheries and Aquaculture (INPA). Regarding the variables, we have 1. Social security: Art. 62 of the Law, proposes that the National Government, through the Ministry of Labor and Social Security, establish a social security system for artisanal fishermen.

1993	Law 101 of 1993	Congress of the Republic of Colombia	<p>This law seeks to protect agricultural and fishing activities, promote the improvement of income and quality of life for rural producers. Regarding the variables, we have the following:</p> <ol style="list-style-type: none"> 1. social security: Although art. 73 of the law provides for the creation of the <i>Caja de Compensação Familiar Campesina</i> as a family subsidy corporation, belonging to the agricultural sector and linked to the Ministry of Agriculture, where it would fulfill social security functions and operate in accordance with the legal provisions relating to family subsidies. This provision does not cover artisanal fishermen.
1993	Law 99 of 1993	Congress of the Republic of Colombia	<p>This law gives the Ministry of the Environment and Sustainable Development (MADS) the responsibility for environmentally managing the use of the territory and adjacent seas.</p>
1997	CONPES 2959 Policy for the Development of Fisheries and Aquaculture	National Department of Planning (DNP) of Colombia	<p>The objective of the Policy is to activate the fishing and aquaculture sector and achieve true economic integration with criteria of social equity, sustainability, economic and environmental competitiveness, through a decentralized model. Regarding the variables, we have:</p> <ol style="list-style-type: none"> 1. Social Security: This policy warns of the precarious situation of access to social services such as health, pensions and benefits for artisanal fishermen, fish farmers and their families and, therefore, recommends the affiliation of artisanal fishermen and their families to the General Social Security System. 2. Food security: Strategies for policy development include the promotion of aquaculture as a way of improving food security through artisanal forms of self-consumption. 3. Women: The Policy seeks to solve the problems of rural poverty and achieve greater involvement of women and rural youth in productive and environmentally sustainable projects. 4. Climate change: No mention (CONPES, 1997)
2011	Decree 4181 of 2011	Presidency of the Republic of Colombia	<p>This Decree establishes the National Authority for Fisheries and Aquaculture (AUNAP) of Colombia.</p>

<p>2014</p>	<p>Comprehensive Policy for the Development of Sustainable Fisheries in Colombia</p>	<p>Colombian Ministry of Agriculture</p>	<p>The Ministry of Agriculture and Rural Development included the formulation of a comprehensive policy for the development of sustainable fisheries in Colombia, with the objective of addressing the problems of the sector, seeking to strengthen and transform this sector.</p> <p>The Policy develops four approaches – integrated, evidence-based, participatory and differentiated by ethnicity – that allow measuring and solving the problems associated with fishing from different areas, such as ecosystem management, sustainable development, spatial planning and management, food security and climate change.</p> <p>The vision or big bet in Colombia for fisheries, for the year 2032, is that it will be sustainable and responsible, contributing to food and nutrition security and the generation of decent jobs through the internal growth of consumption and exportation of products, fisheries and their derivatives.</p> <p>Regarding the policy's specific objectives, the thematic axes and strategies that are directly linked to the variables described are the following:</p> <ol style="list-style-type: none"> 1. Social Security, Training and protection of human resources to improve the working conditions of the actors in the chain, for which it seeks to adopt a differentiated social protection regime for fishermen, in accordance with international standards. 2. Food security. Increased consumption of national fisheries products to improve fishermen's quality of life. The objective is to sign agreements for the distribution of fishery products and by-products with state entities responsible for the development of children, the elderly and vulnerable populations to ensure responsible consumption and promote food and nutrition security. 3. Women: The policy is framed by eight ideas that seek to energize the sector, including a gender focus. This approach directly permeates programs that seek to (i.) strengthen fishermen's organizational processes, (ii.) regional organizational strengthening programs, (iii.) develop the capacities of fishing communities, and (iv.) evaluate the efficiency and effectiveness of the programs developed. 4. Climate change: The policy mentions climate change, but does not consider it as an essential element and does not develop objectives or strategies associated with the theme (MINISTRY OF AGRICULTURE OF COLOMBIA, 2014)
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2019	Agricultural and Rural Development Policy 2018 – 2022. Policy Strategy for the Fisheries and Aquaculture Sector	Ministry of Agriculture and Rural Development of Colombia	<p>The Policy seeks to guide the fishing sector so that it can take advantage, in a rational and sustainable way, of the development of national aquaculture, increase its competitiveness, through job creation, product quality, increase in national consumption and access to new markets, within the framework of an integral development built on the basis of the territory. Regarding the policy's specific objectives, the thematic axes and strategies that are directly linked to the variables described are the following:</p> <ol style="list-style-type: none"> 1. Social security: no mention is made of this. 2. Food security: This is established as a principle of policy action, in which fishing and aquaculture are sought to contribute to the population's food and nutrition security, in which they seek to provide products in the required quantity, quality and safety. 3. Women: No mention is made 4. Climate change: No mention (MINISTERIO DE AGRICULTURA Y DESARROLLO RURAL DE COLOMBIA, 2019)
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Source: authors' preparation.

According to the above, Colombia has been characterized by a fragmented, unstable and changing public policy structure on fisheries and aquaculture, which has prevented the strengthening of true governance that achieves adequate institutional management involving the State and the stakeholders in decision making. Institutionally, responsibility for the implementation of public policies is shared between the Ministry of Agriculture and Rural Development and the Ministry of Environment and Sustainable Development, which has divided the mechanisms established for governance since the establishment of functions in two ministries, creating conflicts of interest among policymakers, public management issues and increased costs associated with designing and implementing public policies (OECD, 2016, p. 18).

This fact has led to a weakening in the creation of public policies that are efficient and have a positive impact on the sector. Even so, with the creation of the National Authority for Aquaculture and Fisheries (AUNAP) and the preparation of an Integral Policy for the Development of Sustainable Fisheries, the State established a more coherent distribution of obligations between the Ministries that consult the interested parties – community, private sector, State (OECD, 2016).

In conclusion, it is necessary to mention that the methodology of socioecological analysis called press-pulse dynamics (COLLINS *et al.*, 2010) of the fishing productive activity, which is described, the assumptions in which there are interactions between the social, legal and institutional aspects and the ecological and biological component in artisanal fishing activities become evident, in order to identify the fishermen's main social protection needs, such as: variability and precariousness of income; difficult working conditions and lack of access to the social security system; health risks; gender distinctions in social protection and lack of access to participation in decisions related to the fisheries sector.

Based on these needs, the main components to be included in the regulation of social benefits for artisanal fishermen are: right to food, food security and sovereignty; climate change adaptation; regulation of fishing gear or instruments; adequate working conditions; access to the social security system; gender equality in the fisheries value chain; and participation of fishing communities. For each of these components, a description will be made and proposals or elements will be presented that should be considered in the Bill on targeted benefits for artisanal fishermen and, in general, for issuing regulations related to the artisanal fisheries sector in Latin America and the Caribbean.

2 RIGHT TO FOOD, FOOD SECURITY AND FOOD SOVEREIGNTY

The right to food is defined as everyone's ability to have access to safe food goods and services. It takes place when each man, woman and child, alone or in the company of others, has physical and economic access, without interruption, to adequate food or the means to obtain it" (OHCHR, 1999, p. 6). The right to adequate food imposes four types of obligations on States: (i) to recognize, (ii) to respect, (iii) to guarantee and (iv) to protect.

The obligation of recognition implies incorporating the law into the national legal order. Among others, through the signing of international instruments, the recognition of the block of constitutionality or the adoption of mechanisms of domestic law. The obligation of respect implies that the State must refrain from taking measures that violate the law. That is, not to impede the accessibility, availability or suitability of food (RESTREPO-YEPES *et al.*, 2020). The obligation of guarantee requires the State to adopt measures that tend to create material conditions for satisfying the right. Thus, the State must make an effort to initiate activities that guarantee the accessibility, availability and use by the population of resources and means to guarantee their subsistence, including the right to food (MOLINA-SALDARRIAGA; CADAVID-RAMÍREZ, 2014). Finally, the obligation of protection implies that in the event of a violation of the right – obligations to respect or guarantee – the State must have mechanisms and procedures of domestic law to determine the damage, the victim, the perpetrator and the reparation or restoration of the right (RESTREPO- YEPES *et al.*, 2017). Last, when an individual or group cannot enjoy the right to food through the means at their disposal, States have an obligation to fulfill this right directly (RESTREPO-YEPES *et al.*, 2018).

Food security implies that "[...] people have physical and economic access at all times to sufficient, safe and nutritious food to satisfy their nutritional needs and food preferences, thus leading an active and healthy life" (FAO, 1996). The National Council for Economic and Social Policy of Colombia (DNP, 2008) defines food and nutrition security as the sufficient and stable availability of food, access and timely and permanent consumption of food in quantity, quality and safety by all people, under conditions that allow its proper biological use, for a healthy and active life (DNP, 2008).

Thus, food security cannot be equated with the right to food.

The former is a component of the latter, associated with access to and availability of food, either on its own or through institutional intervention. On the other hand, food sovereignty is defined as a condition for sustainable human development, in which people have the right to sustainable self-determination with dignity (FAO, 2013). Like food security, food sovereignty cannot be confused with the right to food. Food sovereignty develops the components of accessibility, availability and adequacy of the right to food. In terms of suitability, it emphasizes food safety, biological use and cultural acceptability (FAO, 2013).

Likewise, the Sustainable Development Goals (SDGs 2030), adopted by the Member States of the United Nations, constitute a “[...] set of global goals to eradicate poverty, protect the planet and ensure prosperity for all [...]” (United Nations – UN, 2015). SDG 2 is called “Zero Hunger” and aims to end hunger, achieve food security, improve nutrition and promote sustainable agriculture. Its goals include: ending hunger and malnutrition globally; ensure sustainable food production systems; and implement resilient practices to reduce hunger and malnutrition; adopt measures to ensure the smooth functioning of markets for food products and their derivatives and facilitate timely access to market information to help limit extreme volatility in food prices.

Considering the above, and with a rights-based approach to the regulation of the fisheries sector, it is proposed to reinforce the guarantee of adequate food for artisanal commercial and subsistence fishermen. This rights-based approach is therefore conceived from three dimensions: the right to adequate food, food security and food sovereignty. Thus, the elements that must be considered in the regulation of specific social benefits for artisanal fishermen are:

- Guarantee and protection of the right to food. Its content would be defined by the implementation of the dimensions of the right to adequate food, in conjunction with food security and food sovereignty policies, in order to guarantee the effectiveness of the right and ensure the operation of protection mechanisms.
- Approach to the right to food, food security and food sovereignty. Recognition, respect, guarantee and protection of the right to food includes the accessibility, availability and adequacy of food goods and services for artisanal commercial and subsistence fishermen and their families.
- Protection of the right to food from an emergency perspective: (i) Guarantee and protection of the vital minimum. Policies, plans, programs

and projects in the field of commercial artisanal and subsistence fisheries must be oriented towards guaranteeing the right to a minimum subsistence of commercial and subsistence artisanal fishermen and their families; (ii) The defense of the vital minimum from the perspective of food sovereignty: the defense of the right to food must be guided by the cultural practices and ancestral traditions of these communities, in order to contribute to the social cohesion of this group. They will be the ones to define their own agricultural, fisheries, food and labor policies, among others, so that they are socially, economically, culturally and ecologically suited to their unique circumstances.

- Protection of the right to food through the structure. According to the Voluntary Guidelines for Achieving Sustainable Small-Scale Fisheries in the Context of Food Security and Poverty Eradication (2015), the following aspects should be taken into account: 1. Ownership governance in small-scale fisheries and resource management (a) Responsible governance of property where “fishermen and small-scale fishermen and their communities enjoy secure, equitable and socially and culturally appropriate property rights over fisheries resources” and “[...] protect all forms of legitimate property rights [...]”. And (b) Sustainable management of resources, in which “States and all those involved in fisheries management shall adopt measures for the long-term conservation and sustainable use of fisheries resources and ensure the ecological basis for food production”. 2. Social development, employment and decent work. 3. Value chains, post-harvest activities and trade. 4. Gender equality. Disaster and climate change risks.

3 CLIMATE CHANGE ADAPTATION

Commercial artisanal and subsistence fishing is a productive activity that is threatened by the climate change impacts associated with the availability of fisheries resources, damage to vessels due to storms and floods, and a decrease in the number of species of commercial interest and direct consumption (FAO, 2018). In terms of the right to food, climate change has had negative impacts on the availability, stability, accessibility and sustainability dimensions of the right to food. In this regard, FAO (2019) highlighted that:

- Decreased availability of fisheries resources of marine or continental

origin due to damage to the ecosystem, reduction of populations and distribution of species.

- Affecting the stability of fisheries resources through changes in ecosystem productivity and decline in species of commercial and consumer interest.
- Difficulties in accessing fishing resources due to precarious income and subsistence.
- Changes in the use and consumption of fisheries resources due to declining catches. This situation has raised the need to include a climate change adaptation approach in fisheries regulation in order to increase the resilience of the artisanal fisheries sector. The Intergovernmental Panel on Climate Change (IPCC) defines resilience as “[...] the ability of a social or ecological system to absorb a disturbance without losing its basic structure, functioning, capacity for self-organization or its capacity to adapt to stress and to change” (IPCC, 2014). Thus, the climate change adaptation approach to commercial and subsistence artisanal fisheries incorporates the protection of marine and inland ecosystems essential to ensure the growth of species of commercial and consumer interest. Thus, the elements to be considered in the regulation of social benefits aimed at artisanal fishermen are:
 - To include in the Principles: contribution to the objectives of adapting to climate change and reducing the vulnerability of coastal and riparian ecosystems and communities to its impacts.
 - To include in the Fisheries Management Plans in the territories a differentiated component of adaptation to the impacts of climate change and conservation of essential ecosystems to guarantee the growth and reproduction of species of commercial and consumption interest, as well as a component of delimitation of commercial artisanal and subsistence fishing areas.
 - Include in the functions of the Aquaculture and Fisheries Authority: carry out a differentiated plan for adapting commercial artisanal and subsistence fishing to the impacts of climate change, related to the use of selective fishing instruments, compliance with closed seasons and catch sizes, education and training of fishermen on the conservation of marine and inland ecosystems and measures to prevent and mitigate the risks associated with extreme weather events. The above in coordination with territorial entities and institutions of the National Environment System.

4 REGULATION OF FISHING ARTS OR INSTRUMENTS

In marine and coastal ecosystems, the most significant impacts are caused by fishing arts and gear (NARVÁEZ BARANDICA; HERRERA PERTUZ; BLANCO RACEDO, 2008). The use of non-selective fishing tools and inappropriate fishing methods (such as the use of harmful substances such as cyanide or explosives such as dynamite) cause damage to spawning grounds and species nurseries in marine and terrestrial ecosystems and therefore a depletion of the fisheries resource (COLEMAN; STEVEN, 2019).

However, fishing equipment can be passive or active, depending on the behavior of the species and the functioning of the fishing equipment. Passive gear is designed to make species move towards fishing gear (such as pots or traps). Active equipment, on the other hand, involves targeted pursuit of the species (such as trawls or harpoons) (AUNAP, 2014a).

With regard to passive or active fishing gear or instruments, it is necessary to include in the regulation of the fishing sector instruments that, according to the Code of Conduct for Responsible Fishing, are: (a.) selective of target sizes and species according to its impact on ecosystems and non-target species (incidental fishing); (b.) effective, to improve fishing effort and catches, and (c.) of quality, to avoid loss and damage to gear and, therefore, risks of the activity (FAO, 1995). Thus, the following elements are proposed in the regulation of social benefits aimed at artisanal fishermen:

- To add to the Aquaculture and Fisheries Authority Functions: promote and monitor initiatives for the sustainable development of small-scale fisheries, and the generation of additional jobs, such as new fisheries infrastructure and related fisheries industries and instruments that are selective, effective and high-quality. This is to prevent incidental fishing and pollution, damage to marine and continental ecosystems, quality of catch and efficiency of fishing effort.
- To add to Responsible Fishing Programs: the National Government will create the National Certification seal that accredits the products and their quality from artisanal fishing and the use of selective fishing methods and instruments to ensure the protection of ecosystems and fishing resources.
- Add to the regulation of centers for the collection, landing and distribution of artisanal fisheries: the Aquaculture and Fisheries

Authority will design and implement a permanent training program for artisanal fishermen in the different fishing instruments, according to the species and requirements of selectivity, efficiency and quality to ensure the protection of ecosystems and fisheries resources.

- To add to the economic sanction regulation: any commercial artisanal and subsistence fisherman caught by any of the competent authorities who violates the closed seasons and locations, the size of the species and the permitted fishing tools or gear will be fined with a sanction to be determined by the law in force.
- To add exclusion requirements to regulation: artisanal commercial and subsistence fishermen who are caught in violation of the ban or using unauthorized fishing methods or instruments will be excluded for a period of one (1) year from insurance for the ban, will have their license or card suspended to carry out fishing activities during the period following the ban and will not be able to receive other benefits provided by the State in his condition as a fisherman.

5 WORKING CONDITIONS AND ACCESS TO THE SOCIAL SECURITY SYSTEM

The fishing activity has particular characteristics that make it difficult to record and monitor fishing operations and cause informality in the sector. This is due to biological aspects, such as the seasonality of the fishery resource, mobility and climatic phenomena (PEDROZA GUTIERREZ, 2014). In addition, commercial and subsistence artisanal fishing is characterized by variability in economic income and specific needs for adequate means of work.

Considering the above, as well as the social protection needs of commercial artisanal and subsistence fishermen related to the social security system, we highlight the need to include actions to reduce accidents, to institutionally support the formality of work and the organizations and associations of fishermen, as well as access to social security provisions in fisheries sector regulations. Therefore, it is proposed to include in the functions of the Aquaculture and Fisheries Authority:

- To plan and develop training activities in fishing tools and arts, fishing vessels, processing and marketing of fish products, work formality and artisanal fishing licenses to strengthen the working conditions of fishermen and family income.

- To define a plan for the prevention and attention to accidents in fishing operations, with objectives, goals and indicators, and to promote greater knowledge of equipment and measures to protect and prevent risks to health and social security through training programs and dissemination actions.
- To promote, encourage and accompany artisanal commercial and subsistence fishermen in the construction of business plans and participation in international spaces that allow the export of traditional and non-traditional fishery products through training programs and dissemination actions as part of an institutional training plan.

6 GENDER EQUALITY IN THE PRODUCTION CHAIN AND SOCIAL PROTECTION

In the fisheries sector, men and women have been engaged in complementary activities, which are influenced by the social, cultural and economic context (FAO, 2017), therefore, the inclusion of women's access to social security and participation in the fisheries production chain and decisions related to the fisheries sector is highlighted without distinction in the general and sectoral regulation of fisheries. So:

- Gender, ethnic and territorial approach. Policies, programs, plans and projects adopted in relation to commercial artisanal and subsistence fishing activities must incorporate needs based on gender, ethnic and territorial differences, as a guarantee of material equality.
- To include in the functions of the Aquaculture and Fisheries Authority: develop training, advisory and support programs and actions in the constitution and administration of organizations and associations of artisanal, commercial and subsistence fishermen.
- To include in the regulation of the National Fisheries and Aquaculture Censuses the incorporation of variables on the participation of women in the fishing production chain and decisions related to the fishing sector.
- To promote financing programs in coordination with the competent entities that facilitate the provision of human resources and capital financing for the improvement of vessels and the creation of small service companies (based on vessels and already formalized assets) with a gender focus.

7 PARTICIPATION OF FISHING COMMUNITIES

The sustainable management of fisheries resources and decisions related to the specific needs of commercial and subsistence artisanal fisheries require the participation of fishing communities as an action consistent with the social and democratic rule of law, and with the effective management of fisheries resources. Furthermore, the participation of communities in decisions related to the fisheries sector allows the traditional knowledge of artisanal and subsistence fishermen to be taken into account in fisheries sector policies and for these measures to be implemented more effectively, without ignoring the needs and context of the activity itself.

It is therefore proposed to adjust the regulation of specific social benefits for artisanal fishermen, as follows:

- To include in the Principles of the standard: promotion of the participation of communities and artisanal commercial and subsistence fishermen in decision-making related to their territory, the fishing sector and the management of fisheries resources. The participation of commercial artisanal fishing communities in the product value chain, the reduction of commercial intermediation and the incentive to public purchases should be encouraged.
- To add to the regulation of fisheries management plans: the Aquaculture and Fisheries Authority will implement a strategy so that all fishing municipalities in the country have their Fisheries Management Plan within two years after the enactment of this law. Such a Fisheries Management Plan should be formulated in consultation with the interests of artisanal and subsistence fishing communities.
- To add to the functions of the Aquaculture and Fisheries Authority: plan, define and execute rural development policy implementation programs for artisanal commercial and subsistence fishing communities and fish farmers, with special attention to the vulnerable population and the participation of fishing communities.
- To add to the functions of the Aquaculture and Fisheries Authority: promote and accompany initiatives for the sustainable development of small-scale fisheries and the generation of additional jobs, such as new fisheries infrastructure and related industries, with the participation of fishing communities and taking into account these communities' knowledge and traditional fishing practices.

CONCLUSION

In Latin America and the Caribbean, artisanal fishing is a fundamental productive activity to guarantee the right to food and the local economy of fishermen. However, the evaluation and management of the artisanal fishing sector in the region is complex, given the heterogeneity of the instruments or fishing gear used, the vessels, the species of commercial interest and direct consumption, as well as the diversity of geographic, environmental and socioeconomic conditions. The result is a lack of data and problems for the conservation of marine and coastal ecosystems.

The lack of available information necessary for an adequate understanding of fisheries in the region makes it difficult to determine which management schemes are best suited to the context of artisanal fisheries and the social protection needs of fishermen and communities. Hence the importance of a management that includes the social protection of the people involved in the fishing production chain and the conservation of marine and coastal ecosystems, in order to achieve together the desired objectives of an effective fisheries management.

Considering the above, and based on the methodology of socioecological analysis called press-pulse dynamics (COLLINS *et al.*, 2010) of productive fishing activity, it is shown that it is necessary to analyze the influence of environmental factors on exploitation of fisheries resources in a given area, in order to assess production and biodiversity in the context of climate change, and develop efficient management policies. The knowledge associated with the functional relationships between such resources and the environment is essential for planning future scenarios, thus facilitating control of the possible effects of such changes in the management of fisheries resources.

Bill no. 38 of 2020 “establishes rules to guarantee social benefits aimed at commercial and subsistence artisanal fishermen”, which is currently being processed in the Chamber of Deputies of the Congress of the Republic of Colombia, aims to meet the needs of social protection and improve the productive conditions of fishermen through targeted social benefits.

However, one of the problems with the social benefits provided for in the Bill is that it only covers fishermen belonging to the formal sector, since its requirements include registration with the Regional Office of the National Fisheries and Aquaculture Authority – AUNAP and the General

Fisheries Registry. Considering that the fishing sector is largely informal, such a requirement can be a barrier to the entry of artisanal fishermen and fishing communities.

Thus, and in order to contribute to the regulation proposed by this corporation, and to prepare a roadmap on this issue – in line with the protection of the right to food and food security and food sovereignty – a series of elements is proposed for each of the components: right to food, food security and sovereignty; climate change adaptation, regulation of fishing gear or instruments, adequate working conditions, access to the social security system, gender equality in the fishing value chain and participation of fishing communities. In this way, the proposed elements or considerations can be used in the formulation and application of rules and regulations related to the fishing sector, as well as in participatory policies, strategies and legal frameworks that can contribute to the sustainability of artisanal fisheries in Latin America and the Caribbean.

Indeed, the recognition, respect, guarantee and protection of the right to food includes the accessibility, availability and adequacy of food goods and services for artisanal commercial and subsistence fishermen and their families. Therefore, it is necessary that the rules on the social protection of fishermen incorporate as a principle the protection of the right to food and consider productive activities that are complementary to unemployment insurance, such as aquaculture, so that during the closed season fishermen can have access to adequate food and have economic resources that are not secure.

Having rules and regulations on social benefits for the commercial and subsistence artisanal fisheries sector that articulate social protection, environmental conservation and the right to food is essential to develop policies and strategies that shape a sustainable food system, as part of the efforts needed to end hunger and all forms of malnutrition in Latin America and the Caribbean.

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