Individual Quota System for Anchovy Fishing and the Conservation of Hydrobiological Resources in Chimbote, Peru

ABSTRACT

The objective of this research was to determine whether the access regime and conditions for granting fishing rights; the allocation and duration of the quota system; fisheries control and control actions; and the monitoring, supervision, and sanction of regulatory breaches are the normative criteria of the system of individual quotas for anchovy fishing in direct human consumption to promote the conservation of hydrobiological resources, Chimbote, Peru, 2018. The research was applied, a non-experimental and descriptive correlational design. The sample was composed of National and Comparative Legislation, Doctrine, Jurisprudence, and Records specialized in fisheries issues; and by 30 fisheries experts: lawyers 25% and representatives of fishermen 25%, from the District of Chimbote. Two questionnaires were used for the variables under study. The results showed that the regulatory criteria of the individual quota system for anchovy fishing are 76.7% efficient in the conservation of hydrobiological resources; being Kendall's Tau-b test statistical contingency coefficient τ= 0.89, with a standard significance level of less than 1% ($P < 0.01$). It was demonstrated that the regime of access and conditions for granting fishing rights, the allocation and duration of the quota system, the actions of control and fisheries control, and the monitoring, supervision, and sanction of regulatory breaches are in 76.7% of the normative criteria of the individual quota system of anchovy fishing for direct human consumption to promote the conservation of hydrobiological resources being the statistical contingency coefficient of proof Kendall's Tau-b is τ= 0.89, with standard significance level less than 1% ($P < 0.01$). Likewise, the corresponding proposal was made for the regulation of the normative criteria of the individual quota system of anchovy fishing in direct human consumption to promote the conservation of hydrobiological resources, defining the parameters for their development and viability.

Keywords: regulatory criteria, individual fishing quota system, conservation of hydrobiological resources.

1. INTRODUCTION

When fishery resources are commonly owned and there is free access to them, agents seek to maximize their profits by extracting as many resources as possible. This race leads fishermen to have a greater number of boats, greater holding capacity, and in general a higher level of fishing effort, which leads to the oversizing of installed capacity and overexploitation of resources. Fishing activity has the particularity that the natural resource it exploits is not subject to private property rights. This has encouraged excessive levels of extraction in the world [1]. Overfishing not only reduces the existence of species, whether or not they are subject to fishing but also causes a strong impact on the marine ecosystem. Moreover, mismanagement coupled with this activity causes the fishing industry to lose potential revenues of billions of dollars.

In the last decade, it became clear that fishery resources that were thought to be practically inexhaustible have begun to decline in an unimaginable way. During the decades between the 1960s and 1980s, the production of offshore and inland water fleets increased significantly, by about 6% per year on average. In the 1980s, the growth rate slowed, and in the 1990s, the harvest leveled off, and the global fish production curve became horizontal by reaching 100 million tons annually, and has not changed in the years since. Uncontrolled fishing has spread in both first-world and peripheral countries. This type of fishing has obvious detrimental effects on the species that are caught and at the same time, the ecosystem in which these species live is affected, causing damage to fishermen and their communities. Persistent fishing can lead to the elimination of the largest and oldest specimens of a population or species. Populations suffering from this activity are characterized by less productive individuals, which ultimately leads to a decline in stocks. However, if overfishing is contained and fisheries resources are managed in a sustainable manner, the cost of fish caught declines and harvests increase by leaps and bounds. In addition to the numerous environmental costs, this activity involves economic costs of great importance. If fisheries resources are properly managed, the total harvest could increase by about 10 million metric tons, adding $16 billion annually to gross global revenues.

Mismanagement and overfishing have caused the fishing industry to be poorly managed. In 1992, FAO estimated global revenues from first-hand sales at $70 billion, while the total operating cost of the global fishing fleet was $85 billion, meaning the fleet operates with an annual deficit of $15 billion. Obviously, overfishing entails significant environmental and economic costs. Stopping overfishing and allowing stocks to rebuild would increase productivity and maximize industry revenues in the long run. Such action is necessary to stabilize both resources and industry. It also considers that in the marine species for which information is available, 47 to 50 percent are fully exploited, 15 to 18 percent are overexploited and 9 to 10 percent have been depleted or recovering from depletion. It also has to be that, according to the FAO, about 75% of fish stocks are fully exploited, overexploited, depleted, or recovering from depletion. Despite the adoption of various fisheries regulation mechanisms in recent decades, the problem of overfishing and oversize fishing effort continues to affect the sustainable performance of fisheries. Therefore, the regulation of fisheries is a case that demands increasing attention [2].

States are constantly in search of an adequate administration of the fishing industry and the conservation of species, to guarantee the sustainability of the resource and fishing activity. They must be concerned with both those fisheries already established and those that are underexploited or unexploited. On the side of the fishing industry, an important problem to solve in the future is related to fluctuations in the availability and abundance of resources. Neither fishermen nor processing plant owners can properly schedule their operations when there are large variations in supply. According to this, it is indicated that the flour industry is responsible for the social cost involved in its own working fishermen because they do not reflect economically being part of the flour economic link and the first world power in the export of fishmeal [3].In them there is poverty, there is misery, and risks to the retirement pension, because there is constant aggression to artisanal fishermen, constant aggression to the breeding areas, areas where the greatest reproductive processes of marine resources occur,

and that are on the shore of the Peruvian coast. Likewise, it is said that the flour industry worked in the highest political spheres to appropriate fishery resources [3].

Currently, the international fish trade manages around $102 billion a year, and the sector employs more than 35 million people worldwide (2 million of whom are in Latin America). More importantly, no less than 1 billion people depend on fish as their primary source of protein. However, the model of fishing exploitation developed in the last decade in South America that turned that industry into a world power devastates artisanal fishing on the coasts of the Pacific Ocean, an ancestral trade that is now advancing towards its disappearance. Overfishing are added challenge such to climate change and the increasing levels of pollution of the world's seas, which comes essentially from human activity: garbage and pollution from urban centers, untreated agricultural nutrients, and plastic. In Latin America and the Caribbean, it is estimated that there are more than 2 million fishermen, with a production level greater than 2.5 million MT of hydrobiological resources, and a production value of approximately US$ 3,000 million per year [4]. (Oldepesca, 2010). The region is home to three of the world's largest marine ecosystems on its South American coasts; the most important being the Humboldt Current which crosses the Pacific coasts of Chile, Peru, and Ecuador and contributes almost 20 percent of the world's total catch fisheries. Other important ecosystems in the region are the Patagonian Platform which makes up Argentina and Uruguay, and the Southern Brazilian Platform, both in the Atlantic Ocean [5]. Several fishing countries in the region (Peru, Chile, Mexico, and Brazil) have implemented measures to improve the current situation, including strengthening the institutions that regulate trade systems and clarifying the borders that cause the bleeding of marine heritage. Additional measures include bans, global or individual quotas, taxes, or economic incentives for fishermen, and at the global level, the Global Partnership for the Oceans was created in 2012, to protect marine flora and fauna, and promote sustainable fisheries. Therefore, for some time now, concern has been emerging about the region's fishery resources and their sustainable extraction over time. Among the models of regulation, a system of Individual Quotas has been implemented, which addresses two aspects, the biological and the economic. On the biological side, this system creates incentives for fishermen to prevent the resource in question from being overexploited. From the economic point of view, incentives are generated for fishermen to efficiently manage their fleets [6] (Miller, 2014).

In Peru, the fishing industry is no stranger to these problems, Despite the adoption of various fisheries regulation mechanisms, the oversizing of some fleets and processing plants, and the overexploitation of the main resources of the Peruvian fishery, such as anchovy, sardine, and hake, are a clear example of this. Despite having a General Fisheries Law since the nineties and since then it has been modified countless times, however, it is currently very difficult to comply with the rule because it has a series of 'gaps' and 'tricks' to be able to escape the law, it also turns out that, according to the record of the satellite system, there are boats within 5 miles and only a minimum amount is sanctioned, of which not all fines are paid. The General Fisheries Law (LGP), Decree-Law No. 259773, and its Regulations (RLGP), Supreme Decree No. 012-2001-PE4, establish the general parameters governing fishing activity in Peru, which seek to promote the sustained development of fishing activity as a source of food, employment, and income, and ensure responsible use of hydrobiological resources. Although

both rules include the common regime, this does not prevent the fishery in a specific area, such as the Amazon Fisheries Management Regulation, Ministerial Resolution No. 147-2001-PE, or a particular fishery, such as the Regulation on Fisheries Management of the Anchovy Resource for direct smoked consumption, through special regulations, Supreme Decree No. 010-2010-PRODUCE [7] (Ministry of Production, 2010).

In the current situation of the fishing sector, the Peruvian State does not assume responsibility for the solution to the oversize of industrial fishing that is directly harming artisanal fishing and direct human consumption of fish. This2018 marks 10 years since the publication of Legislative Decree 1084, a norm that established for the first time a system of individual quotas for anchovy fishing in Peru. The objective of D.L. 1084 is to establish the fisheries management by LMCE in order to ensure the responsible use of anchovy, improve the conditions for the modernization and efficiency of the extraction and production sector for direct human consumption and promote its sustained development as a source of food, income, and employment; in harmony with the preservation of the environment and the conservation of biodiversity [8] (Presidency of the Republic, 2008). Likewise, the regulatory framework indicates that the artisanal fleet is dedicated exclusively to CHD and that the smaller-scale fleet is preferable to CHD since the discard regulations allow smaller-scale vessels to allocate up to 10% of their catches to the manufacture of residual flour, while the industrial fleet can only fish for CHI. However, current regulations also allow CHD Plants, which receive catches from the artisanal and smaller-scale fleet, to allocate up to 40% of what is received and declared unsuitable for their process, to the manufacture of residual flour, that is, to CHI. [9].

In the last ten years, there have been many debates in the country about Individual Fishing Quotas as an instrument for regulating fisheries. These meetings revealed the lack of information on the operation of the instrument itself and the little knowledge about the results of its application in various fisheries in the world; in addition to the natural resistance to change. Likewise, fishing activity presents a clear example of the economic problem that is generated by not assigning property rights over collective goods. In an open-access fishing system, entrepreneurs will be incentivized to increase their operations due to the abundance of resources and the high rate of return. In the long term, the entry of more entrepreneurs will generate strong pressure on the fishery resource, which is finite, causing the income to dissipate and the stock of resources to decrease below its level of biological sustainability. The system of exploitation of fisheries included in the LGP and the RLGP is mainly aimed at protecting hydrobiological resources above all else. That end is valid, however, in the light of the principle of sustainable development, it is not enough. However, the responsible authorities do not take into account mechanisms to improve this situation. Unlike the current model, the IPC system is built on the conservation of resources and the economic efficiency of fishing activity. Undoubtedly, in developing countries such as Peru, it is not enough to conserve the hydrobiological resources, in addition, it is important to ensure that the activity is economically efficient [10]. This system of Individual Fisheries Quotas (IPC) consists of granting each fisherman the right to extract a certain amount of hydrobiological resources from the biomass available in a period of time. In this way, each shipowner knows, in advance, what is the maximum number of resources he can extract, regardless of the number

of boats he has and their holding capacity. In contrast to the current model, the IPC system seeks to divide the global quota by the number of fishermen participating in the fishery. However, it should be clarified that this division does not propose to grant property rights over individual quotas but to grant transferable administrative rights of exclusive use of a percentage of the total stock [11].

One of the biggest challenges in implementing the IPC system is to choose the criteria for granting the right to regular access to the global quota. Thus, the standards recognize the IPC system as the mechanism by which individuals are allowed to participate in the global catch quota. So far, for teaching purposes, reference is made to a proportional division of the overall catch quota; however, multiple initial distribution patterns could be outlined such as historical fishing, auction, and random distribution, among others. The decision requires a multidisciplinary approach where the legal, economic, social, and ecological aspects have to be taken into consideration to find the permanent distribution factor (De la Puente, 2016). The proper functioning of an individual quota system depends closely on the State's ability to monitor that quota holders respect the catch limit allocated to them. Fishing rights contribute to the financing of hydrobiological resources conservation activities in general (including research, monitoring, and control), so it must be determined whether there is a need to reform the amount and formula for calculating fishing rights [12].

It follows that the use of a System of Individual Transferable Quotas provides an opportunity for fisheries to achieve the total quota available with maximum social benefit. However, studies referring to the costs of administering systems regulated under CIT have usually been ignored. However, the trafficking of these fishing rights has become an even greater problem, so it must require prior recognition by the Administration so that it can be detected. In this way, it is avoided that the same individual quota can be transferred to more than one fisherman, that the quota is transferred more than once, if the particular law prohibits it, and control the balances when the quotas are divided. According to the above, the transfer of individual quotas must have express recognition by the Administration, which can be made possible through the establishment of an administrative procedure of prior evaluation [9]. The implementation and management of a fishery regulated under CIT involve significant administrative activities, such as formulation and implementation of public policies, monitoring, and control to detect illegal behavior, and finally, economic and marine research. All of the above can have significant fishery management costs. Thus, the level of administration costs and who they fall on (The government or fishing industry) could have significant impacts on the design and operation of a CIT system [13]. (Arnason, 2000). Munro [14] points out that the allocation of fishing quotas to fishing companies or owners and the limitation of fishing vessels have made it possible to order fisheries management and ensure the sustainability of the resource and extractive activity in those countries where they have been implemented. In this sense, it points out that, from a stage characterized by a hard and disorderly competition between companies to capture the largest amount of the fishing resource, with the allocation of quotas fisheries management is ordered, and the pressure for the resource is reduced and a moment of cooperation is reached between the companies or shipowners that are part of that system. It also recommends implementing the quota allocation system in the management of the different fisheries, either by companies, shipowners, or

fishermen's cooperatives, because that will allow fisheries management to be ordered. There is (labor, fuel, and maintenance, among others). It also points out that the amount paid does not take into account that the costs of extraction and industrial processing of anchovy directly harm the marine ecosystem and artisanal fishing. The way in which the anchovy fishery is controlled is deficient and it is necessary to improve the monitoring mechanism of vessels at sea and anchovy unloading points, the criminalization of sanctions that dissuade sea users from non-compliance with the quota system, and the imposition of such sanctions when there are cases of non-compliance [15].

In 2015 a bill was presented with the purpose of creating the National Superintendence of Fisheries and Aquaculture (SUNAPES), establishing that this body would assume the functions of control and sanction that today fall on Produce, maintaining the regulatory and sanctioning role in different institutions and thus guarantee the independence in the action of the entity in charge of the application of sanctions, however, to this day there is no news about it [10].In the case of Lima, the system of individual quotas for the anchovy fishery has achieved several of these benefits as it has reduced the Olympic race, ensuring a productive and responsible activity at the same time, as highlighted by international organizations such as the IDB, World Bank, and OECD. Likewise, it is indicated in a complementary way that individual quotas are important because through their mechanisms global catch quotas can be established in a scientific way, control discharges, and avoid under-reporting and illegal fishing, so it is necessary to continue working on the use of the system of individual quotas in all fisheries of the country. More than 300 kilometers from Lima is the artisanal landing of Chimbote, one of the most important fishing ports in the country and from where 2,000 fishermen set sail in search of anchovy, silverside, parakeet, mackerel, bonito, and other resources of the coast. Armed with their fishing gear, these men hope to find abundant fish that will then reach the table of Chimbotano homes and throughout the country. However, fishermen have been looking at the Peruvian coast with concern for a few years. Fishing, which used to take only hours, is taking days. It is warned that the activity of large vessels affects the availability of fish for human consumption.

More than fifty years have passed and the primacy of Chimbote is still in force, despite the emergence of other ports along the Peruvian coast. However, the quality of the fishing industry located in Chimbote leaves much to be desired. A large part of the fishmeal factories are old and generate negative impacts on the environment. They also produce standard quality flour instead of specializing in the production of prime flours that have higher protein content and are quoted at higher prices. But perhaps the most striking thing is that, despite the long time that has passed, Chimbote has only managed to develop an incipient cluster that has not led to more specialized fishing businesses or promoted economic diversification. As a result, the incomes of its population remain low. It is said that the fishermen of the northern coast warn that the fishing activity of large vessels affects the availability of fish for human consumption and consequently fishing for them. In Chimbote, artisanal fishermen are worried, as they say, that greater licenses will be given to the large fishing industries, leaving them without the opportunity to get the product of their work and affecting direct human consumption in families. Industrial boats are causing terrible damage because when fishing anchovy, they catch white fish for the production of flour. This leads to the scarcity of fish

and threatens the economy of artisanal fishermen. In this way fishing is an activity that can be inclusive but the flour industry is nothing but exclusive. According to this, the production of anchovy for human consumption is important, in addition, there are many activities that can be done with anchovy that turn out to be more profitable than fishmeal.

Institutional management in Chimbote is limited, due to the lack of institutional tradition in this district and the centralization of decision-making of the main agents of this cluster. The trade associations established in Chimbote are local in nature and are born as a response to a lack of representation of the National Fisheries Society, which represents a great institutional vacuum in this district. The main feature of the legislative framework that regulates the fishing sector is that it grants fishing licenses or authorizations by biological species. In the case of anchovy, the law establishes instruments of control over both extraction and inputs. Fishing quotas are not granted, which has caused the oversizing of the industry, and although for several years the possibility of moving to a quota regulation has been analyzed, various interests have prevented the change. There seems to be a slightly more open attitude on the part of the National Fisheries Society, but first, it is necessary to solve certain problems, such as the excess fleet and the financial situation of the companies. It is necessary to adopt a system of catch quotas for anchovy and any other fishery, in order to generate the appropriate economic incentives to avoid the overexploitation of marine resources and, therefore, the oversizing of the industry. An ordering scheme like this will have favorable effects on the cluster because, by granting property rights over the resource, shipowners and flour companies will not have to compete with each other and will be more open to taking advantage of the spaces of cooperation.

In this sense, the following problem was raised: What are the normative criteria of the individual quota system for anchovy fishing indirect human consumption to promote the conservation of hydrobiological resources, Chimbote, 2018? Hence, the relevance of this research is justified because it explains acutely the objectives of the instrument of individual fishing quotas as a means of regulation in fisheries administration and control since this sector is of great importance for the Peruvian economy. In this sense, the CIP system, for access to fisheries, represents a system that deserves to be seriously evaluated in Peru, with broad participation not only of fishing entrepreneurs but of the various actors of civil society, since the decisions adopted will affect the country in general since it is necessary to carry out an analysis of the problems and limitations faced by the current measures for their correct application in the determination of fisheries that may or may not be included in an IPC system. It is necessary to define a State policy for the fishing sector to face as a country the problem of the oversizing of the fishing fleet and industry, considering, in addition, that this is not a problem only of the private sector because it affects the state of natural resources; as well as other important issues related to hydrobiological resources. Other problems such as the diversification of the activity, currently concentrated in anchovy for indirect human consumption, must also be faced regardless of the application or not of the CIPs; strengthening institutions, including strengthening IMARPE and its investigations; control of illegal activity; and the development of aquaculture and production with greater added value. In this way, the general objective was to determine whether the access regime and conditions for granting fishing rights; the allocation and duration of the quota system; fisheries control

and control actions; and the monitoring, supervision, and sanction of regulatory breaches are the normative criteria of the system of individual quotas for anchovy fishing in direct human consumption to promote the conservation of hydrobiological resources, Chimbote, 2018. Likewise, the following specific objectives were: 1) Describe and analyze the system of individual quotas for anchovy fishing and the conservation of hydrobiological resources, 2) describe and analyze the system of individual quotas for anchovy fishing for direct human consumption in national legislation, 3) check whether the access regime and conditions for granting fishing rights; the allocation and duration of the quota system; fisheries control and control actions; and the monitoring, supervision, and sanction of regulatory breaches are normative criteria of the system of individual quotas for anchovy fishing in direct human consumption that allow promoting the conservation of hydrobiological resources, Chimbote, 2018.

2. METHODOLOGY

The population of this research according to its design and type is formed by:

P1: By Legal material (Legislation, Jurisprudence, Doctrine, Files) printed, graphic, virtual, and Web content, which will serve as a theoretical, conceptual, and/or methodological source.

Q2: The population will also be made up of lawyers (as it is a highly equitable activity as a group of experts) and representatives of fishermen from the Chimbote District.

The sample is composed of National and Comparative Legislation, Doctrine, Jurisprudence, and Records specialized in fisheries issues; and by 30 fisheries experts: lawyers 25% and representatives of fishermen 25%, from the District of Chimbote. The research is applied, with a cross-sectional correlational descriptive research design.

2.1 Collection and Analysis of Legal Material

Exegetical method; literal, logical-semantic, and extensive components will be applied. Its interpretation will be made according to the letter of the law, exact and proper sense; that is, strict interpretation sense, since this way of interpreting is used when the words have a single meaning in the norm as something perfect and static; in that sense, this research seeks the analysis of the legislation regarding fishing activity and the regulation of the individual fishing quota.

Systematic method; the concepts and principles located in the standard were applied, taking into account their interpretation through sets or subsets of regulations, in order to establish the scope of the conceptual elements of the regulatory structure; it will serve to understand the relationship between the individual quota of anchovy fishing for direct human consumption and the regulation to manage and control fishing activity.

Sociological method; it is carried out in response to the requirements of the social reality of the current moment since the Law not only regulates life in society but is also a product of it; in that sense, this research will be oriented to seek convenience in the regulation of the individual quota of anchovy fishing for direct human consumption for artisanal fishermen.

Hermeneutic-Legal Method; will be used in the interpretation of legal bodies, with the aim of understanding the true meaning of legal methods regarding the individual quota of anchovy fishing for direct human consumption and the regulation to manage and control fishing activity.

2.2 For Data Analysis

Inductive–Deductive Method; applied in order to achieve through the collection of data, the conclusions of the research work, the same that can make statements of a general nature to produce new scientific legal discernment.

Analytical-Synthetic Method: it will be used in the analysis and conduct of research in an integral way; allowing to explain and understand the nature of the phenomenon and the object to be studied by synthesizing specific and precise notions of the subject under study to achieve the objectives set.

2.3 Techniques, Procedures, and Instruments

The survey; survey was used as a research strategy carried out on a sample of subjects, based on their verbal or written statements, using standardized interrogation procedures in order to obtain measurements of a large number of objective and subjective characteristics of the population.

Documentary analysis: it allowed to study and understand the magnitude of written instruments (files, opinions, parliamentary opinions, legal criteria, etc.), since it is a significant means for the literal analysis of these, covering the realization of deductions and qualitative assessments of the variables developed.

Hemerographic: it was executed through the analysis of scientific documentary records and local and national newspapers, classifying the sections related to the purpose of the research and recording in the files, those of greater extension and depth in the sources of information.

Legislative: with this technique, it was possible to integrate the foundations stipulated in the legal norm, laws, regulations, statutes, and other legal instruments.

2.4 To process Data

Documentary Collection; was applied to obtain doctrinal, legislative, and jurisprudential information on the issue of the individual fishing quota system for direct human consumption and the conservation of hydrobiological resources, Chimbote, 2018

Normative Interpretation; was applied in the analysis and interpretation of legal norms, legal texts, as well as principles and constitutional guarantees related to the subject matter of research.

The questionnaire: it is a procedure considered classic in those for the collection and registration of data, it allows to register the information requested to the same subjects, it will be applied to experts in fisheries: lawyers and representatives of fishermen of the District of Chimbote. With this, information was collected on the variables under study: Normative criteria of the individual quota system for fishing for direct human consumption and the

conservation of hydrobiological resources. The questionnaire for the independent variable; Normative criteria of the individual fishing quota system, contains 4 dimensions: access regime and conditions for granting fishing rights, the allocation and duration of the quota system, fisheries control and control actions, and the monitoring, supervision, and sanction of regulatory breaches, this will allow determining the normative criteria of the system of individual quotas of anchovy fishing in direct human consumption to promote the conservation of the hydrobiological resources. The questionnaire was composed of 24 items. The questionnaire for the dependent variable; conservation of hydrobiological resources, contains 4 dimensions: catch limits, juvenile protection measures, preventive measures of environmental impact, and orderly and sustainable management, this will allow determining the normative criteria of the system of individual quotas of anchovy fishing in direct human consumption to promote the conservation of hydrobiological resources. The questionnaire was composed of 24 items.

3. RESULTS AND DISCUSSION

In Table 1, there is the variable normative criteria of the individual quota system for anchovy fishing, where 93% (28 lawyers and representatives of the fishermen of the Chimbote district) consider them efficient, followed by 7% (2 lawyers and representatives of the fishermen of the Chimbote district) who consider that they are regularly deficient and finally 0% of lawyers and representatives of the fishermen who consider them deficient. In accordance with the above, it is necessary to maintain that the respondents consider that the proposed normative criteria are efficient and with this, the conservation of hydrological resources can be improved. It can then be said that the individual fishing quota system is effective insofar as its regulations allow the incentives for the oversizing of the industry to disappear. In principle, it prevents the continued overexploitation of the resource, and eliminates the possibility of competition and rivalry between fishermen, since each of them has an individual quota allocated and its catch potential will not be affected by the actions of other fishermen (to the extent that they all respect the limits imposed by their respective quotas). In fact, this system leads to a change in the time horizon relevant to the optimization of decisions of the agents operating in a given fishery, going from maximizing short-term profits to considering long-term benefits, thus generating incentives consistent with the biological sustainability of the resource.

Table 1. Levels of the regulatory criteria of the individual quota system for anchovy fishing for direct human consumption

LEVELS	Regulatory criteria for the individual fisheries quota system	
	P	%
Deficient	0	0
R. eficiente	2	7
Efficient	28	93

TOTAL	**30**	**100**

Table 2 presents the dimensions of the individual fisheries quota system, where the largest number of responses consider that they are efficient, according to the following percentages: access regime and conditions for granting fishing rights 53%, the allocation and duration of the quota system 77%, fisheries control and control actions 97%, and the monitoring, supervision and sanction of regulatory breaches 97%. The system of individual transferable quotas means that with the establishment and allocation of this type of property rights to fishery resources, a state of equilibrium can be achieved where there is no excessive overcapacity of the fishing fleet and generate the incentives to ensure its sustainability in the long term. In this sense, through control, monitoring, and control actions, a reduction in overcapacity will be achieved and an optimal stock could be achieved with an efficiency that would make it possible to collect an income from the fishery, being that the regulatory infractions committed will have a sanction. Finally, with the increase in the profitability of the fishery, the bargaining power of the crew would increase, resulting in higher salaries. In the same table, it is observed that the dimensions with the highest score are the monitoring, supervision, and sanctions of regulatory breaches and actions of control and fisheries control, both with 97% which allows maintaining that these criteria

Table 2. Levels of the dimensions of the normative criteria of the individual quota system

LEVELS	The regime of access to conditions for granting fishing rights		Allocation and duration of the quota system		Fisheries control and control actions		Monitoring, supervision, and sanctions of regulatory breaches	
	P	%	P	%	P	%	P	%
Deficient	1	3	0	0	0	0	0	0
R. Efficient	13	44	7	23	01	3	01	3
Efficient	16	53	23	77	29	97	29	97
TOTAL	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**

In Table 3, there is the variable conservation of hydrobiological resources, where 100% (30 lawyers and representatives of the fishermen of the district of Chimbote) consider it to be high, followed by 0% (0 lawyers and representatives of the fishermen of the district of Chimbote) who consider it to be average and finally 0% of lawyers and representatives of the fishermen of the district of Chimbote who consider it to below. This allows us to conclude that the conservation of hydrobiological resources is important, so it is essential to apply systems that limit their extraction, using clean materials and equipment that allow a healthy product, of high nutritional value and quality, as well as the conservation of species in each fishing season.

Table 3. Comparison of scores obtained from levels of conservation of hydrobiological resources

LEVELS	Conservation of hydrobiological resources	
	P	%
High	0	0
Average	0	0
Low	30	100
TOTAL	**30**	**100**

Table 4 presents the dimensions of the conservation of hydrobiological resources, where the largest number of responses from respondents consider that it would be high, according to the following percentages: catch limits 77%, juvenile protection measures 67%, preventive measures of environmental impact 70%, and orderly and sustainable management 87%. In that order, hydrobiological resources were thought to be unlimited. However, with the development of science and the evolution of fisheries, this belief has been shattered, being that it is now known that natural resources, despite being renewable, are limited and have to undergo proper management if they are to be sustainable. To achieve the conservation of resources, at least these four components must be taken into account: catch limits, protection measures, preventive measures, and orderly and sustainable management. Then, an efficient fishing activity will be achieved for an optimal biomass trajectory and the optimal evolution of the marine habitat and ecosystem, which will allow the harmonization of the fishery with the other uses of fishery resources. Efficient fishing activity can be divided into the static and dynamic allocation of economic or financial resources. Static allocation consists of the efficient allocation of short-term economic or financial resources (fishing gear, fishing methods) and dynamic allocation includes fishing scheduling and unloading, and capital investment or divestment (vessels, industrial establishments).

Table 4. Levels of dimensions of conservation of hydrobiological resources

LEVELS	Catch limits		Juvenile protection measure		Preventive measures of environmental impact		Orderly and sustainable management	
	P	%	P	%	P	%	P	%
Low	0	0	0	0	0	0	0	0
Average	7	23	10	33	9	30	4	13
High	23	77	20	67	21	70	26	87
TOTAL	**30**	**100**	**30**	**100**	**30**	**100**	**30**	**100**

Table 5 shows that 76.7% of the lawyers and representatives of the fishermen of the Chimbote district consider that the individual anchovy fishing quota system is efficient, therefore, the conservation of hydrobiological resources is high. Likewise, it can be seen that the statistical contingency coefficient of Kendall's Tau-b test is $\tau = 0.89$, with a standard significance level of less than 1% ($P < 0.01$); verifying that the figure of the Anchovy Individual Quota System indirect human consumption promotes the conservation of hydrobiological resources, Chimbote, 2018.

Table 5. Table of the relationship of the individual quota system of anchovy fishing and the conservation of hydrobiological resources, Chimbote, 2018

REGULATORY CRITERIA		HYDROBIOLOGICAL RESOURCES		Total
		AVERAGE	HIGH	
REGULARLY EFFICIENT	N°	0	6	6
	% of total	0,0%	20,0%	20,0%
EFFICIENT	N°	1	23	24
	% of total	3,3%	76,7%	80,0%

Total	**N°**	**1**	**29**	**30**
	% of total	**3,3%**	**96,7%**	**100,0%**

Kendall's Tau-b (τ) = 0.89 Sig. P = 0.001< 0.01

3.1 Description of the System of Individual Quotas for Fishing for Anchovy for Direct Human Consumption in National Legislation For the data processing, the main rules, regulations, doctrine, and jurisprudence governing fisheries management were used, which are linked to the institutional framework, decision protocols, supervision, and control. In Peru, anchovy fishing (*Engraulis ringens*) for direct human consumption is developed through fisheries management by Maximum Catch Limits per Vessel (LMCE) or also called the quota system. This system makes it possible to set a catch limit, expressed in tonnes, for a finite number of fishing vessels for each fishing season. This catch limit is the LMCE which is the result of multiplying the Maximum Total Allowable Catch Limit (LMTCP) by the Maximum Catch Percentage per Vessel (PMCE). The main objective of the individual quota system is to reduce the capacity of the fleet in order to achieve an efficient allocation of economic and fisheries resources [16] (PRODUCE, 2008).

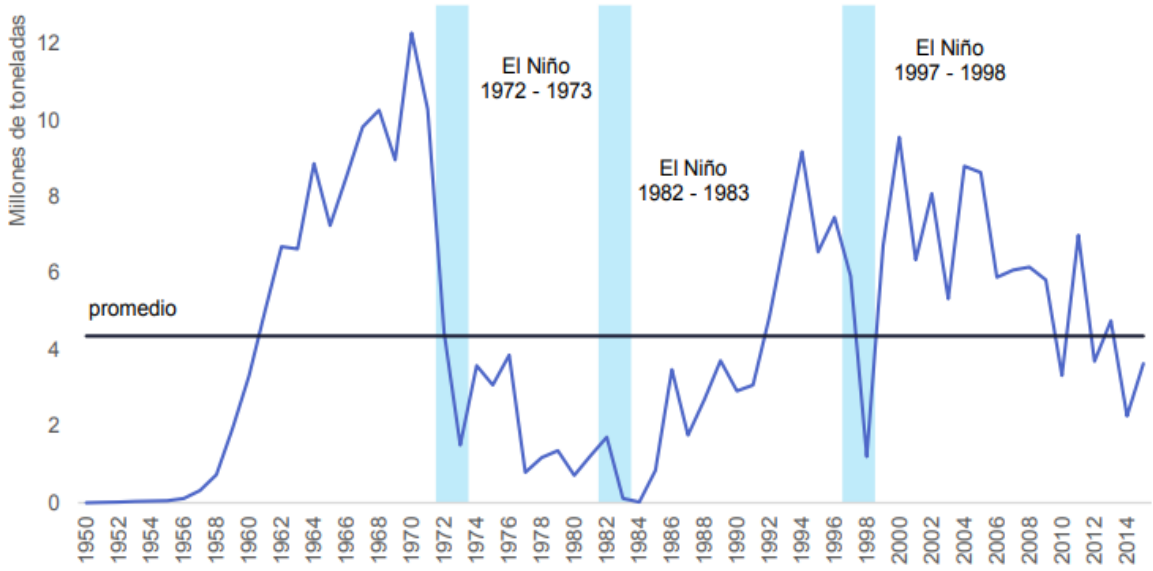

Fig. 1. Anchovy discharges, in million tons, 1950 - 2015

Source: Produce - Ministry of Production

According to Caillaux [17](2013) individual quota systems are considered one of the most successful fisheries management models worldwide. It also considers that this system has made it possible to align incentives between the actors involved in these fisheries. Among the benefits identified are greater efficiency of the industry, an increase in the total value of fisheries, improvement in fishing safety, and sustainability of the resource. In the case of Peru, the system of individual quotas for the anchovy fishery has achieved several of these benefits, as it has reduced the Olympic race, ensuring a productive and responsible activity at the same time, as highlighted by international organizations such as the IDB, World Bank,

and OECD. The study carried out by Caillaux indicates that in a complementary way to individual quotas, mechanisms are important to scientifically establish global catch quotas, control discharges, and avoid under-reporting and illegal fishing, so it must be followed in order to use the system of individual quotas for direct human consumption in the Chimbote fishery [18]. (FPAS, 2015).

The system of individual quotas is an instrument that allows the reduction of the costs of the participants in the fishery, the reduction of incentives towards the race for the resource, and the increase in the value of fishing licenses. The participants of the fishery manage to reduce their costs and achieve greater efficiency of their resources, due to the better programming they can make of their extraction and processing activities. In addition, incentives to race for the resource are reduced by ensuring each fishing vessel a share of the global quota [19](Anderson, 2000). The system of individual quotas increases the value of fisheries' property rights by improving their characteristics. These characteristics are: i) duration, ii) exclusivity, iii) security, and iv) transferability. The outstanding difference between a conventional fishing license and a license with an individual transferable quota lies in the level of exclusivity. With a conventional fishing license, you have to compete, every season, against other fishing vessels for your catch, that is, it has a low exclusivity [20](Scott, 2000).

It is determined that this system regulates fishing seasons by assigning quotas to a finite number of individuals. Individuals can be a specific person, a company, a group of people, a boat, or a community. The quota can be set in tonnes, fishing gear, or fishing effort. And the term transferable refers to the characteristic that has the quota of being marketed [19](Anderson, 2000). When carrying out the corresponding study of the operation of the quota system in the process of establishing fishing seasons, they obtained the criteria of access regime and conditions for granting fishing rights, allocation and duration of the quota system, fisheries control and control actions, and monitoring, supervision and sanctions of regulatory breaches. The Ministry of Production authorizes the seasons based on the scientific reports issued by IMARPE (Instituto del Mar del Perú) in order to determine the beginning and end of the season and its corresponding LMTCP (Maximum Total Permissible Catch Limit). It also assigns the LMCE (Maximum Catch Limit per Vessel) and authorizes the extractive activity of fishing vessels. Prior to the start of each season, IMARPE conducts at least one hydroacoustic cruise to collect biological data on sizes, distribution, concentration, and other information necessary to estimate the total anchovy biomass. After the analysis of the biological data, IMARPE prepares the corresponding scientific report and recommends the Maximum Total Allowable Catch (MTCP) and the duration of the fishing season. The recommendation is estimated through the Protocol "Estimation of the total permissible catch of the north-central stock of Peruvian anchovy" [21, 22]; IMARPE, 2016). The main data of the fishing season are published in the ministerial resolution authorizing the fishing season. The ministerial resolution contains the beginning and end of the season, as well as the LMTCP.

With the publication of the ministerial resolution, the nomination process and the assignment of the LMCE begin. The nomination process consists of the communication by the holders of the fishing permit of the use they are going to make of their LMCE and the authorization of the PRODUCE to carry out the extractive activity: The holders of the fishing permit of a vessel with PMCE can nominate their boat to extract, to be parked and that another boat makes use of its LMCE, or to serve a suspension penalty. PRODUCE will only authorize a fishing permit holder to make use of its LMCE if it has no debts to PRODUCE for (i) fines or (ii) fishing rights.

The LMCE system allocates an individual quota to a given number of vessels to be used during a fishing season. The quota assigned to each vessel is called LMCEj and results from multiplying its Maximum Percentage of Catch per Vessel (PMCEj) and LMTCP.

$$LMCEj = LMTCP \times PMCEj$$

Most of the discharges (1,548 322 tonnes) come from the industrial steel fleet and the rest (366 730 tonnes) from the industrial timber fleet. The average yields per boat have maintained the pattern identified at the beginning of the season, with partially full holds with values less than 30% for steel boats and 50% for wooden boats. The overall average has also been quite low, particularly for the steel fleet, but has managed to exceed the average values of 2009.

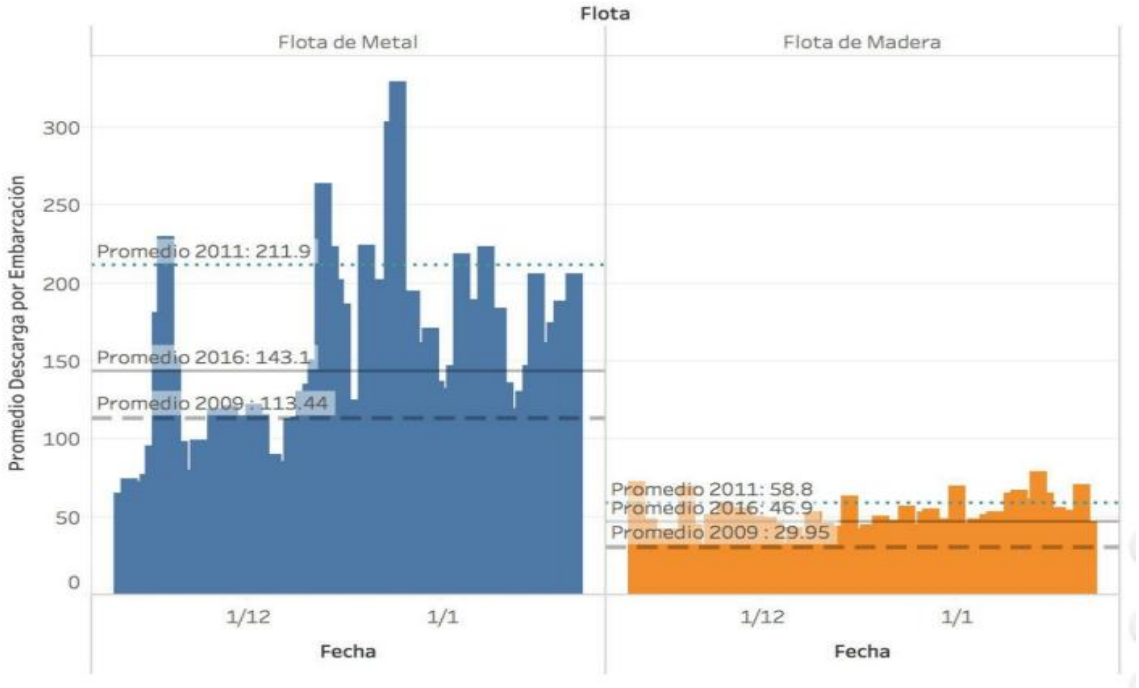

Fig. 2.Average daily discharge by fleet type

Source: IMARPE [22]

The ports of Chimbote and Chicama are the ones that have received the largest discharges, both for the steel and wood fleets. In the case of the steel fleet, they accounted for about 50% of all landings and in the case of the wooden fleet, more than 80%. Other important ports for the steel fleet have been Chancay, Callao, and Végueta.

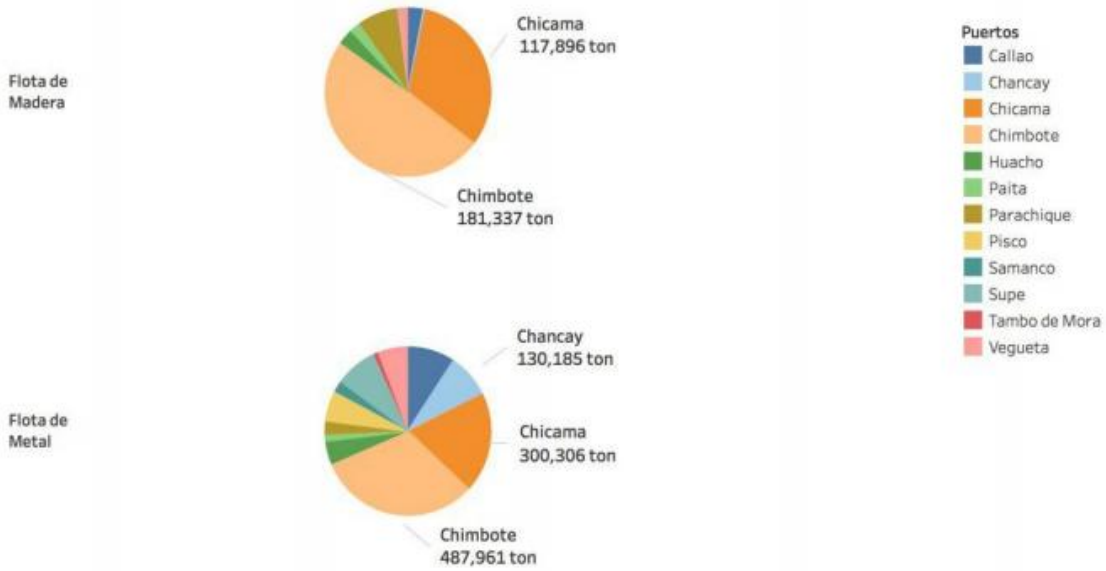

Fig. 3. Total discharges by port of disembarkation

Source: IMARPE [22]

Finally, a fishing season ends when the LMTCP is reached or when the duration of the season is fulfilled, to give way to the reproductive closure of the stock and its corresponding renewal for the following season.

Fig. 4. The authorization process for a fishing season in the Stock Norte Centro anchovy fishery

Source: Ministry of Production

As in most countries that have opted for the system of individual transferable quotas, Peru opted for an initial allocation based on the historical catch or unloading and the size of the vessels rather than an auction [23] (Shotton, 2000). With this initial form of allocation, a better PMCE was assigned to the most efficient vessels that made a greater catch. Also, when taking the warehouse capacity, a variable is being used that approximates the investment

made by the holder of the fishing permit. With the investment it is used as an indicator of confidence in the anchovy fishery and that it has every intention of staying in the fishery. For the fleet under the regime of Legislative Decree No. 25977, the historical unloading and holding capacity of the vessel were used. And for the fleet under the regime of Law No. 26920 only the historical capture was used. Likewise, for boats with a hold capacity of less than 45 m3, an additional bonus was distributed for socioeconomic factors. The rule does not specify what were the reasons for establishing two different methods for each regime or what are the socioeconomic factors used to define in 45 m3 the recipients of the bonus.

Table 6 shows that 60% of the lawyers and representatives of the fishermen of the district of Chimbote, consider that the normative criterion of access regime and conditions to grant fishing rights of the individual fishing quota system is efficient; therefore, the conservation of hydrobiological resources is high. At the same time, it is observed that the statistical contingency coefficient of the Tau-b test of Kendall is $\tau = 0.68$, with a significance level of less than 1% of standard significance ($P < 0.01$); this figure proves that the normative criterion of access regime and conditions to grant fishing rights of the individual fishing quota system promotes the conservation of hydrobiological resources, Chimbote, 2018, therefore, the hypothesis is accepted. When a fishery is managed by restricting who can have access to fishing, how much fishing activity (fishing effort) individual participants can exercise or how much catch each can have, they are said to have rights of use. These rights of use are recognised or assigned by the competent management authority (whether formal or informal). For example, the entry limitation - seen as input control from the perspective of resource management - can be seen as a 'right of access' from the perspective of fishers' management. Certain individuals, groups or communities have the right to use the fishery (i.e. to go fishing) while everyone else does not have that right. Similarly, limiting the number of traps that are allowed to be used could be seen as a restriction (negative), or as a right of use (positive) – the fisherman, group or community has the right to use a certain number of traps [24].

Therefore, it is expected that by granting an exclusive right over a fraction of the maximum permissible catch, the incentives for overinvestment in capacity will be eliminated, since the volume of fishing that corresponds to each user is prefixed, the extreme competition that occurs when such a limit does not exist would cease to make sense. In this sense, it is presumed that each economic agent will optimize its capital investment without exceeding its fishing capacity, as has generally happened when there has been no individual distribution and the management and control methods that have been implemented for the administration of resources have not worked. The regime of access to extractive fishing activity is constituted by the authorizations of increase of fleet and the fishing permits, the same that are granted in accordance with the provisions of the Regulation, as well as according to the degree of exploitation of the hydrobiological resources existing at the time of issuing the administrative resolution constituting the right.

The fishing permit is the authorization granted by PRODUCE to a person, person, company or company for the operation of fishing vessels in order to extract one or more hydrobiological resources. Persons or companies holding a fishing permit are referred to as fishing permit holders. According to the standard, it is understood that artisanal fishing formalization ends, when the fishing permit is obtained. It will apply to government entities linked to the process of formalization of artisanal fishing activity; being the beneficiaries of

the norm the owner or artisanal owner of fishing vessels of up to 6.48 gross tonnage, who carries out fishing tasks in the maritime field [25] (PRODUCE, 2016).

Table 6. Contingency table of the access regime dimension and conditions for granting fishing rights as a normative criterion of the individual fishing quota system in direct human consumption to promote the conservation of hydrobiological resources

ACCESS REGIME AND CONDITIONS		HYDROBIOLOGICAL RESOURCES		Total
		AVERAGE	HIGH	
DEFICIENT	N°	0	1	1
	% of total	0,0%	3,3%	3,3%
R. EFFICIENT	N°	0	10	10
	% of total	0,0%	33,3%	33,3%
EFFICIENT	N°	1	18	19
	% of total	3,3%	60,0%	63,3%
Total	**Recount**	**1**	**29**	**30**
	% of total	**3,3%**	**96,7%**	**100,0%**

Kendall's Tau-b (τ) = 0.68 Sig. P = 0.001< 0.01

Table 7 shows that 70% of the lawyers and representatives of the fishermen of the Chimbote district consider that the normative criterion of allocation and duration of the quota system of the individual fishing quota system is efficient; therefore, the conservation of hydrobiological resources is high. Therefore, it is observed that the statistical contingency coefficient of the Tau-b test of Kendall is $\tau = 0.79$, with a significance level of less than 1% of standard

significance (P < 0.01); this figure proves that the normative criterion of allocation and duration of the individual fishing quota system promotes the conservation of hydrobiological resources, Chimbote, 2018, therefore the hypothesis is accepted. The allocation of fishing quotas to fishing companies or owners and the limitation of fishing vessels have made it possible to order fisheries management and ensure the sustainability of the resource and extractive activity in those countries where they have been implemented. From a stage characterized by a harsh and disorderly competition between companies to capture the largest amount of the fishery resource, with the allocation of quotas fisheries management was ordered, the pressure for the resource was reduced and a moment of cooperation is being reached between the companies or shipowners themselves that are part of that system [26](Management, 2017). The duration begins the scheme under transitional quotas, over time it will tend to apply criteria of prolonged duration. The case of Iceland is a good example of the results that can ultimately be achieved by moving forward gradually. While the first individual quota system used in Iceland dates back to 1979 (for the herring fishery), the perpetuity characteristic of CIPs only came into force in 1990, and their transferability only from 1988. Previously, they operated individual quota schemes subject to restrictions in both dimensions [2]. Companies in the fishing sector manage their fleet by making the less efficient vessels transfer their fishing permits (quota) to the most efficient vessels, with which the ceding vessels pass to the situation of 'not nominated'; if this happens for more than two seasons, these vessels definitively give up their fishing permit (and with this, the quota to which they are entitled) and, if they do not have authorization from the Ministry of Production for their alternative use, they must proceed with the scrapping of the boat. In this scenario, common among fishing companies, it is highly likely that they will have to recognize a loss for the non-recoverable cost of non-nominated vessels. The balance of the quota law is positive for the results of fishing companies but requires that they establish sufficient controls to properly manage the risks that still persist [27].

Within this context, the extreme competitiveness of the users of a fishery should be mentioned, taking into account that they work on the same resource with the aforementioned characteristics, where the decisions that are taken individually in relation to the level of effort will affect its totality in the biological, economic and social aspects. As a result, when there is no adequate management system, access to fishery resources remains open, and the decision on the volume to be caught is of an individual nature, without considering the combined effect on other users. In this sense, the unlimited expansion of fishing operations results, sooner or later, in the overexploitation of resources and the overinvestment, and decreasing and insufficient economic returns. Past experiences in all regions of the world repeatedly prove that the above phenomena inevitably appear if access to fisheries is not controlled. In this sense, it is necessary for the Fisheries Administration to make decisions about objectives and take action to implement measures to achieve them, even if the information and the results of the analyses on the resource, fisheries, and users are not complete.

Table 7. Contingency table of the allocation dimension and duration of the quota system as a normative criterion of the individual fishing quota system in direct human consumption to promote the conservation of hydrobiological resources

ASSIGNMENT AND DURATION		HYDROBIOLOGICAL RESOURCES			Total
		HIGH	AVERAGE	LOW	
R. EFFICIENT	N°	6	0	0	6
	% of total	20,0%	0,0%	0,0%	20,0%
EFFICIENT	N°	21	2	1	24
	% of total	70,0%	6,7%	3,3%	80,0%
Total	**N°**	**27**	**2**	**1**	**30**
	% of total	**90,0%**	**6,7%**	**3,3%**	**100,0%**

Kendall's Tau-b (τ) = 0.79 Sig. P = 0.001< 0.01

Table 8 shows that 80% of the lawyers and representatives of the fishermen of the district of Chimbote, consider that the normative criterion of fisheries control and control actions of the individual fishing quota system is efficient; consequently, the conservation of hydrobiological resources is high. Therefore, it is observed that the statistical contingency coefficient of the Tau-b test of Kendall is $\tau = 0.87$, with a significance level of less than 1% of standard significance ($P < 0.01$); this figure proves that the normative criterion of fisheries control and control actions of the individual fishing quota system promotes the conservation of hydrobiological resources, Chimbote, 2018, therefore, the hypothesis is accepted. The Ministry of Production is responsible for the control and controls the entire production chain of the sector, from the extraction, landing, production, processing, and marketing of hydrobiological resources [28] (Management, 2013). Comprising artisanal vessels, smaller scale and larger scale, processing plants for fishery products for Direct and Indirect Human Consumption, residual flour plants, and discard and waste reuse plants. During the validity of the fishing season, it is necessary to follow up and monitor extractive and productive activities in order to comply with the regulation established in the quota system. The follow-up and monitoring of anchovy discharges and fishmeal production are carried out by the Fisheries Surveillance and Control Program, and Landing in the Maritime Field. In addition, a Satellite Monitoring System – SISESAT has been implemented, which aims to monitor extractive activity within the national maritime zone [29](Ministry of Fisheries, 2001) and the Program of inspectors on board whose objective is to verify at sea, the correct development of extractive activities, prioritizing the collection of information regarding the presence of juvenile specimens [30]. The main objective of the management of the anchovy fishery is to protect the broodstock and juveniles so that the stock is renewed. Therefore, it is positive to have a limit technically established by IMARPE [22]. Whereas, this limit should be set at the beginning of the season

Table 8. Contingency table of the dimension of fisheries control and control actions as a normative criterion of the individual fishing quota system in direct human consumption to promote the conservation of hydrobiological resources

CONTROL AND CONTROL ACTIONS		HYDROBIOLOGICAL RESOURCES			Total
		HIGH	AVERAGE	LOW	
DEFICIENT	N°	1	0	0	1
	% of total	3,3%	0,0%	0,0%	3,3%
R. EFFICIENT	N°	2	1	1	4
	% of total	6,7%	3,3%	3,3%	13,3%
EFFICIENT	N°	24	1	0	25
	% of total	80,0%	3,3%	0,0%	83,3%
Total	**N°**	**27**	**2**	**1**	**30**
	% of total	**90,0%**	**6,7%**	**3,3%**	**100,0%**

Kendall's Tau-b (τ) = 0.87 Sig. P = 0.001< 0.01

Table 9 shows that 70% of the lawyers and representatives of the fishermen of the Chimbote district consider that the normative criterion of monitoring, supervision, and sanction of the normative breaches of the individual system of fishing quota is efficient; consequently, the conservation of hydrobiological resources is high. Therefore, it is observed that the statistical contingency coefficient of Kendall's Tau-b test is $\tau = 0.71$, with a significance level of less than 1% of standard significance ($P < 0.01$); this figure proves that the regulatory criterion of monitoring, supervision, and sanction of regulatory breaches of the individual fishing quota

system promotes the conservation of hydrobiological resources, Chimbote, 2018, therefore, the hypothesis is accepted. Monitoring and control during the season are carried out by PRODUCE through the Surveillance and Control Program (PVC), the On-Board Supervisors Program, and the Satellite Monitoring and Control System (SISESAT). PVC is responsible for supervising and controlling the discharges of fishing vessels into industrial fishmeal processing plants so that only authorized vessels are unloaded and do not exceed their LMCE. The on-Board Supervisors Programme has the function of supervising the capture of juveniles and discards at sea. SISESAT is the system responsible for monitoring the location of fishing vessels [29](Ministry of Fisheries, 2001).

The Satellite Tracking System has the mission of locating, monitoring, and supervising the activities of fishing vessels in order to effectively comply with current legal regulations on fisheries. The Satellite Tracking System is a tool that is intended to ensure the responsible use of the hydrobiological resources contained in the jurisdictional waters of Peru, which constitute The Heritage of the Nation, as established by the Political Constitution of Peru and the General Fisheries Law. Likewise, the On-Board Supervisors Program has the function of supervising at sea the capture of juveniles and discards [30].SISESAT is the system responsible for monitoring the location of fishing vessels [29](Ministry of Fisheries, 2001). In the event of a breach of fishing regulations, Supreme Decree No. 019-2011-PRODUCE supreme decree is applied, approving the Single Ordered Text of the Regulation on Fisheries and Aquaculture Inspections and Sanctions – RISPAC, which contains the list of infractions and sanctions related to fishing activity [31].On the one hand, reducing or eliminating penalties for juvenile fishing facilitates larger catches and would therefore expect yields to be higher and the season shorter. However, when there are too many juveniles in the sea, there must be frequent and extensive closures of fishing areas, which reduces the catch of the following days and lengthens the season. Also, as seen above, the capture of juveniles is a significant economic loss and puts at risk the recovery of the stock. This depends on the size of the fishery as well as oceanographic conditions but is unlikely to be sustainable as a management measure if the percentages of juveniles in the stock are very high. Although it is still early to evaluate the impact of the change in regulations on the sustainability of the resource, the available information indicates that the catch percentages of the different fractions of the stock adults (with sizes greater than 12 cm), juvenile recruits (between 9 to 12 cm), juveniles (between 6 to 9 cm) remain below the tolerance limits recommended by IMARPE [22]. Special mention deserves the attention that has received the management of anchovy in various media. This has affected at least two presentations before the Congressional Production Committee and the submission of requests for information from fishermen's guilds concerned about the high rate of juveniles and peladilla in the nets.

Table 9. Contingency table of the dimension monitoring, supervision, and sanction of regulatory breaches, control actions, and fisheries control as a normative criterion of the individual fishing quota system

MONITORING AND SUPERVISION	HYDROBIOLOGICAL RESOURCES	Total

		LOW	AVERAGE	HIGH	
DEFICIENT	N°	2	0	0	2
	% of total	6,7%	0,0%	0,0%	6,7%
R. EFFICIENT	N°	4	0	1	5
	% of total	13,3%	0,0%	3,3%	16,7%
EFFICIENT	N°	21	2	0	23
	% of total	70,0%	6,7%	0,0%	76,7%
Total	**N°**	**27**	**2**	**1**	**30**
	% of total	**90,0%**	**6,7%**	**3,3%**	**100,0%**

Kendall's Tau-b (τ) = 0.71 Sig. P = 0.001< 0.01

4. CONCLUSIONS

It was demonstrated that the regime of access and conditions for granting fishing rights, the allocation and duration of the quota system, fisheries control and control actions, and the monitoring, supervision and sanction of regulatory breaches are in general the normative criteria of the individual quota system of anchovy fishing for direct human consumption to promote the conservation of hydrobiological resources. This system represents an institutional and instrumental policy that has as fundamental premises the economic efficiency of the industry and the conservation of hydrobiological resources simultaneously, so it is important to determine the regulatory criteria in order to establish the guidelines to be followed in the use of resources for the benefit of fishermen and residents of the city of Chimbote. The regime of access and conditions for granting fishing rights is 60% one of the normative criteria of the individual system of fishing quota in direct human consumption to promote conservation of hydrobiological resources. It is important to evaluate and analyze the conditions and rights to grant authorizations and licenses in the development of fishing activity, carrying out research activities of hydrobiological resources for direct human consumption. The allocation and duration of the quota system is generally one of the normative criteria of the individual fishing quota system for direct human consumption to promote the conservation of hydrobiological resources. Allocating individual fishing quotas promotes success by coordinating collective solutions to rationalize fishing efforts and encourages the search for efficient solutions to the problem of surplus fishing capacity and overexploitation of resources. Fisheries control and control actions are generally one of the normative criteria of the individual fishing quota system for direct human consumption to promote the conservation of hydrobiological resources. Therefore, the formulation of control and control standards of national scope aimed at optimizing the use of raw material of hydrobiological origin, facilities and equipment, as well as the control or responsible use of fishery resources for direct human consumption. The monitoring, supervision and sanction of regulatory breaches is generally one of the normative criteria of the individual fishing quota system for direct human consumption to promote the conservation of hydrobiological resources. These systems are therefore important, because the excess of the quota must be controlled and each shipowner must be monitored individually, in order to solve the problems of illegal and incidental fishing.

Consent

As per international standard or university standard, respondents' written consent has been collected and preserved by the author(s).

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