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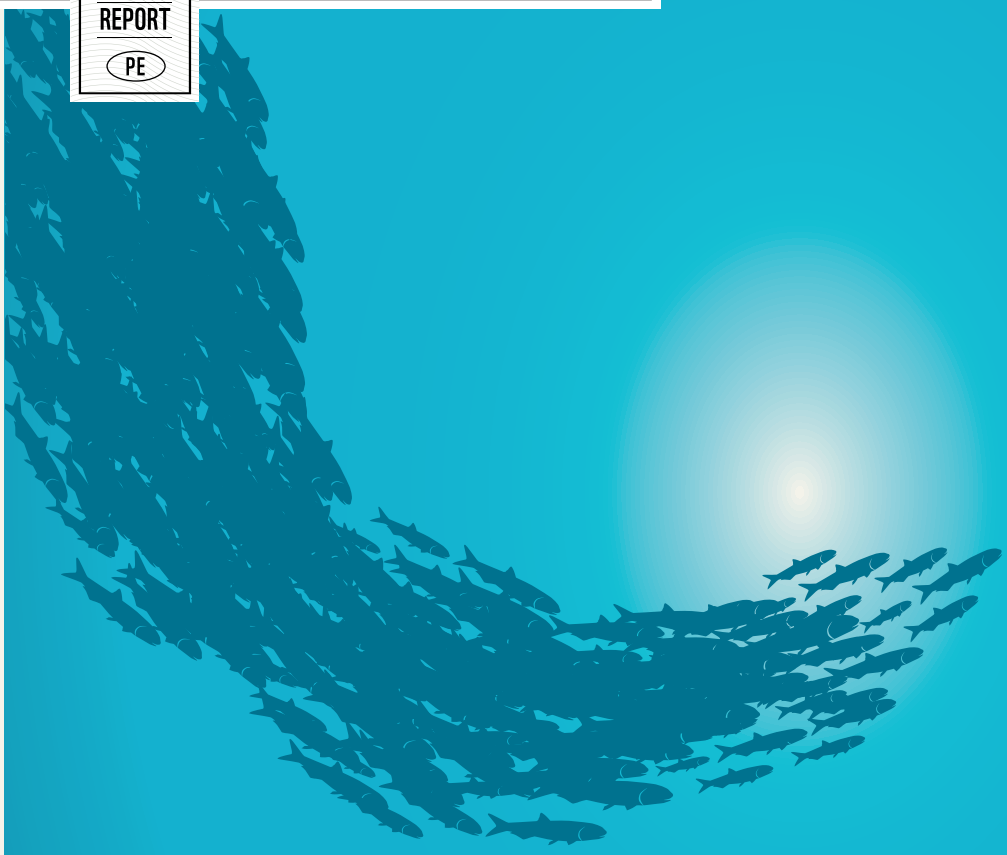

Economic and Regulatory Analysis

# AGAINST THE CURRENT

## Challenges for the sustainability of the anchoveta fishery

By Carlos E. Paredes and Úrsula Letona Pereyra

The opinions in this document are the exclusive responsibility of the authors and do not necessarily reflect WWF, COLES, and USMP opinions.


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The results of this study were presented at a conference on April 29th, 2013 and were enriched by comments and contributions from economist Elena Conterno, former Minister of Production; Freddy Sarmiento, President of the Congressional Production Committee; Mariano Gutiérrez, GEF-Humboldt Project Technical Official; and journalist Patricia del Río, who deserves our special gratitude. Similarly, the authors thank all the conference participants whose comments, criticism and suggestions contributed to the drafting of the final version of this document.

# FOREWORD

In the mid-nineties, the condition of fisheries around the world was a matter of major concern. Different studies held that entire species would likely disappear due to overfishing, as it had happened in Peru at the beginning of the 70s with anchoveta, which bounced back only after 20 years.

As a result of this situation, WWF, the world conservation organization, committed to support sustainability of fish resources globally. In 1997 it partnered with Unilever to create fishing sustainability standards, including for industry sourcing. A team of world experts were called to draft those standards and they created the Marine Stewardship Council (MSC) that subsequently became an independent organization.

MSC categorized the principles of sustainability in three areas:

i. Stock management
ii. Eco-systemic approach (to take into account the impact of catch on the trophic chain)
iii. Support to regulatory frameworks

Peru is internationally regarded as a country with an appropriate resource management set up, including a reputable marine regulatory organization and regulations that have allowed it to preserve its most important species, anchoveta. In 1997, an assessment determined that the marine resource was fully exploited and that no new quotas should be allocated. Legislative Decree 1084 was much celebrated because it mandated a quota allocation scheme for the industrial sector, thus contributing to improve industry efficiencies.

However, there is still much room for improvement in Peru's fisheries management. For instance, the industrial and direct human consumption quotas should not be separated, since doing so opens the way to illegal activities. Current regulations must be strengthened to ensure transparency; artisanal and small scale fisheries must be more strictly overseen; and Instituto del Mar del Perú must remain as an independent entity free from political influences and pressures from vested economic interests. Finally, the tax structure must be reviewed

to make sure that the fisheries industry makes a sufficient contribution to its own its administration and control.

Nevertheless, in the last 20 years successive administrations have failed to establish sufficiently clear goals and objectives to ensure resource sustainability.

WWF charged researchers Paredes and Letona, through a partnership with Instituto del Perú – USMP, to prepare a review of the regulatory framework that could eventually lead to a proposal for the executive branch to work jointly with civil society in an effort to accomplish a sustainable anchoveta fishery, and turn Peru into the global spearhead of sustainable resource management. This paper is a call to dialogue among various stakeholders and hopefully a starting point for a high-level debate on regulations and structures that should be changed to achieve a shared objective: the sustainability of the anchoveta fishery for the benefit of present and future generations.

# EXECUTIVE SUMMARY

This document analyzes the regulatory framework for anchoveta and its impact on resource sustainability. The study explains the incentive structure generated by the main regulations in the industry and the behavior of agents induced by such incentives, most of all concerning their impact on fisheries sustainability. In the last 20 years, fisheries, policies and regulations have lacked internal coherence and have not been very predictable. By not formulating clear targets for fisheries sustainability, different regulations passed in several occasions have endangered the resource instead of strengthening its sustainability. Thus, the sector has become disordered, vulnerable to corruption and, hence, prone to illegal activities as a profitable option.

The main proposals are:

i. The central objective of fisheries policies needs to be simple and stable along time: "Promoting sustainable and efficient development in our fisheries" and not including objectives that go beyond the industry;
ii. Permanent sea research and monitoring should be fostered to ensure sustainability. Policy decisions should be based on independent and sound scientific recommendations;
iii. Separating the fleet for industrial use and for direct human consumption is a fiction that we should be over with. To do so, it will first be necessary to adapt regulation; to have follow-up, control and surveillance systems, and hence industry's institutional set up, so that going forward there may be a global quota regime and individual catch quotas for the entire industry;
iv. Every economic agent that profits from and exploits hydro biological resources should pay fishing fees to do so which should cover, at least, all the fisheries administrative costs;
v. Amending regulations concerning fishing of juveniles to incentive timely catch reports, removing incentives that promote discarding at sea, and thus contributing to effective closing of fishing areas on a timely basis, heavily sanctioning infringers that fish in closed areas;
vi. Reinforcing control and monitoring actions in all the process chain of industrial plants of any size and kind, including residual meal and solid waste reuse plants.

vii. Reviewing SISESAT's organizational design structure and passing effective legislation obliging all economic players to install a satellite follow-up or similar system;
viii. Totally changing the sanction regime so that sanctions can be effectively enforced and become dissuasive tools against behaviors that we seek to eliminate; and
ix. Reforming and ordering the industry's institutional set up, separating the monitoring and control functions (the most critical area at PRODUCE) through the creation of the National Fisheries Superintendence, to carry out functions related to industry regulation, promotion and policy that should remain under the Fisheries Vice Ministry.

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# INTRODUCTION

This document identifies and analyzes the main regulations that make up the regulatory framework on anchoveta. Said regulations have been chosen because they have a substantial impact on efficiency, on equity and on the sustainability of our main fisheries. The document highlights the incentive structure generated by the main regulations in the industry and the behavior of agents induced by them, most of all concerning their impact on fisheries sustainability.

The regulations to be analyzed cover five areas: (i) access regimes to fisheries and fishing rights; (ii) regulations on fishing of juveniles; (iii) residual meal processing and solid waste reuse plants; (iv) monitoring and control systems; and (v) sanction regime. Following this analysis, (vi) a brief characterization of the regulations and governance in the sector is presented. Finally, section (vii) is a summary of the main challenges to be faced in the industry and the policy recommendations deriving from the analysis this document presents. The study was financed by WWF. A number of interviews to different people in several sectors – public officials, politicians, entrepreneurs and scholars were made to develop this study, so as to learn from them and get valuable information and suggestions for research. Evidently, any error is the exclusive responsibility of the authors.

# 1. REGIMES OF ACCESS TO FISHERIES AND FISHING RIGHTS

For more than fifty years now, regulation on access to anchoveta fisheries and payment of fishing duties have differentiated between vessels that fish for (i) indirect human consumption (IHC), that is, for factories that produce fishmeal and fish oil; and (ii) vessels whose fishing is aimed at direct human consumption (DHC), that is, fresh, frozen, canned or cured anchoveta. The IHC fleet is known as industrial fleet (larger steel or wood vessels with a hold capacity of more than 32.6 cubic meters), while the fleet for DHC is made up by the artisanal fleet (vessels with holds of up to 10 cubic meters) and the small scale fleet (with holds between 10 and 32.6 cubic meters). Currently, the regulatory framework stipulates that the artisanal fleet is exclusively devoted to DHC and that the small scale fleet preferably to DHC, because the regulation on discards allows small scale vessels to aim up to 10% of their catch to the manufacturing of residual meal, while the industrial fleet may only fish for IHC. However, current regulations also allow DHC plants, which receive catch from the artisanal and the small scale fleets, to allocate up to 40% of what they receive and declare as not adequate for their process, and thus to assign it to manufacturing residual fishmeal, that is to IHC.

Regarding the total volume of allowed fishing, the current regulatory framework has stipulated for more than 20 years that the Ministry must fix a "global" catch quota for the industrial fleet before the start of each fishing season. Also, it should do so according to recommendations made by scientific authorities (IMARPE). This regime was transformed and modernized with the introduction of individual fishing quotas for the industrial fleet in 2008. By contrast, fishing by the artisanal and small-scale fleets, even today, is not subjected to a global catch quota, and even less so to individual quotas.

In this context, treatment of fishing duties, not surprisingly, is differentiated according to IHC or DHC, with the latter exempted from paying fishing duties. Nevertheless it should be underscored that a differentiated regulatory framework for the same fisheries, according to the use of the catch, has little scientific or logical basis. Clearly, the anchoveta biomass is only one, no matter if the catch is for DHC or IHC. Moreover, regulations aimed at ensuring species sustainability should regulate the fleet as a whole.

Under the current relative cost and price structure, where relative profitability is more on the IHC side than on DHC fishing, and given limited supervision and control capacity by the authorities, a capacity that is almost inexistent for the small-scale and artisanal fleets, it is not surprising that these regulations that artificially segment fisheries are constantly broken. In fact, artisanal and small-scale ships' owners have substantial incentives to "divert" their fishing to

fishmeal and fish oil production, and they do so because they can.
In view of the weak current regulatory regime in place, the question is whether keeping an artificially segmented fishery makes sense. In fact, it is not clear at all why smaller anchoveta fishery players – both artisanal and small-scale – should be prevented from optimizing the benefits of their work by prohibiting them from sending their landings for fishmeal and fish oil making. However, before engaging in an in-depth discussion, it is useful to analyze the evolution of regulations governing access to this fishery.

## 1.1 ACCESS TO FISHERIES

The latest regulations under the General Fishing Law (Supreme Decree N° 012-2001-PE) establish that the access regime to the extractive fishing activity is managed by means of fleet increase authorizations and fishing permits. These regulations hold that to provide stability to the regime of access to the extractive activity, the then Ministry of Fisheries (now merged into the Ministry of Production or PRODUCE) had to meet with three prior conditions: (i) Obtaining "the written express consent of companies representing at least 80% of the total volume of hold capacity for resources where the access regime is to be changed, and of companies representing 80% of the installed capacity of the fisheries' industrial facilities authorized to process those resources;" (ii) following "the corresponding IMARPE reports;" and (iii) obtaining the "recommendations from a panel of internationally acknowledged scientists on fisheries, specifically called to assess the condition of the resource and its fishing industry."

The quest for stability of the rules of access to fisheries manifest in the 2001 regulations was a response to the high regulatory volatility of the nineties. In fact, the preamble to the new regulation (Supreme Decree N° 012-2001-PE) holds that under the former regulations (Supreme Decree N° 01-94-PE), rules "were subjected to numerous amendments and complementary and additional regulations (...) hence, it is necessary to approve the new regulations for the General Fishing Law to streamline past regulations and amendments, and to include mechanisms to create juridical and economic stability with the purpose of encouraging private investment in the fishing industry..."

Although having stable and coherent regulations with explicit industry policy objectives consistent with the industry's sustainable development is undoubtedly desirable, it is not clear that the amendments to the rules of access to fish resources have to be approved by those who already have access rights. Why? The General Fishing Law in Article N° 2 establishes that "hydro-biological resources within Peru's jurisdictional waters belong to the Nation. Consequently, the State should regulate the management and rational exploitation of those resources..."

In any case, the most important amendment to the regime of access to fisheries in the last year did not comply with the stipulations set forth in the regulation. Regulations as important as Legislative Decree N° 1084, from 2008 (individual quota law), Ministry Resolution N° 100-2009 and Supreme Decree N° 010-2010 (that regulate access to the anchoveta fishery by artisanal or smaller vessels) and Supreme Decree N° 005-2012-PRODUCE (determining access to fishing bands in the sea) were not previously shared for public comment or pre-published so that different fisheries' stakeholders could contribute and/or make suggestions as set forth in the Legislative Systematization Norm. Besides, they were not based on IMARPE's scientific reports in the sense of recommending or guaranteeing this band system. Moreover, they were not supported by the opinion of a scientific panel that should have analyzed them previously.[1] The point to highlight here is that fisheries' regulations – particularly concerning rules of access to fisheries – have been unstable and not very predictable.

Thus, Peru's fisheries policy is in practical terms only a collection of isolated and scattered regulations without scientific base, as is evident in the explanations that substantiate all the Supreme Decrees enacted in the last 10 years, and which do not include an evaluation program to ensure their ongoing improvement.

## Industrial or Large Scale Fleet

In the 20 years that followed the enactment of the General Fishing Law (1993-2012), different milestone regulations were introduced regarding access to anchoveta fisheries. The first dates back to 1997 when Supreme Decree N° 001-97-PE published the result of the General Census of Large Fishing Vessels charged to the National Statistics and Informatics Institute (INEI) and Bureau Veritas, a private company. These lists comprised franchised vessels. Non-franchised were given a deadline to register and therefore have access to anchoveta fisheries for IHC. In practice, only the vessels on the lists could get a fishing permit. If they were not able to comply, then they were supposedly banned from extractive activities.2 Based on census figures, Ministry Resolution N° 781-97-PE declared the anchoveta fishery fully exploited.

Therefore, after the abovementioned regulation was issued, the Ministry of Fisheries (now Ministry of Production) should not have issued a single additional fishing permit for IHC anchoveta, something which did not happen, as we will see. However, in 1998, a year after the IHC anchoveta fishery was declared fully exploited and closed, it was reopened by Law N° 26920. Even worse, this Law opened a back door that lasted approximately 5 years and allowed wood vessels between 32.6 and 110 cubic meters hold capacity, of the so-called "Viking" class, could directly apply for a IHC anchoveta fishing permit by simply filling some document and vessel inspection requirements. Law N° 26920 had established these were ships that had been engaged in extractive activities in northern country and had to be registered. While it was in effect, the Law increased

the number of ships applying for registration from 82 vessels in 1998 to 600 vessels in 2003 (Paredes & Gutierrez, 2008). Even as this report was prepared, PRODUCE was still evaluating applications connected to this Law following court decisions, thus only worsening the situation.

This leads us to reflect about the need to enforce the prohibition to increase the fleet. If new ships cannot be built, except to replace other vessels and with a construction permit from DICAPI, how is it new ships are seeking registration based on amendments to the regulations?

Legislative Decree N° 1084 of June 2008 came into effect during the first fishing season in 2009. It is undoubtedly the most important regulatory milestone in the period under study. This Law substantially changed the regime of access to the anchoveta fishery by introducing individual fishing quotas (Maximum Catch Limits per Vessel) and by assigning them to industrial ships that were already operating in this fishery, pursuant to their fishing record and hold capacity. As expected, allocation of such property rights increased the industry's efficiency, which translated into a significant increase in the profits of companies that operated in this industry. However, it also raised issues of fairness and, more importantly, for the sustainability of species sustainability and the long term variability of fisheries since the allocation was not supported by an appropriate follow-up, control and monitoring system.

Before the report, a global catch quota which, when reached, determined the end of the fishing season, led ship owners to try to fish as much as possible in the shortest possible time. A behavior pattern known as the "Olympic race," it resulted in overinvestment in the industry, both in fleet and in plants (Paredes & Gutiérrez, 2008; Galarza, 2009) and meant ever shorter fishing seasons. Following the reform, as shown in Table 1, the number of fishing days increased twice and the number of vessels dropped, confirming the positive effect of the report to slow down the "Olympic race" and its resulting inefficiencies.

Besides helping to cut costs, the new regime improved the quality of landed anchoveta and, therefore, allowed making better fishmeal, with the consequent improvement in the profits of fishmeal manufacturers (Paredes, 2012). Certainly, in terms of efficiency, the new regime earned industry significant earnings and society as a whole. Together with the individual quota system and the end of the Olympic race, it also helped to stop wasting the potential benefits of the ocean's wealth.

TABLE 1:
**ANCHOVETA FISHERIES INDICATORS**
NORTH-CENTER ZONE, 2008-2011

| INDICATORS | Without LMCE systems 2006 - 2008 | With LMCE systems 2009 - 2011 |
|---|---|---|
| Authorized fishing period | - | **2009:** Apr-20 to Jul-30/ Nov-06 to Jan-31<br>**2010:** May-13 to Jul -31/ Nov -20 to Jan-31<br>**2011:** Apr -01 to Jul -31/ 23-Nov -23 to Jan-31 |
| Number of ships | 1,079 | 944 |
| Fishing days (annual average) | 54 | 153 |
| Premium meal production % | 40% | 51% |
| Fleet efficiency | 62.8% | 58.0% |
| Steel ships | 61.5% | 56.3% |
| Wooden ships | 69.3% | 66.4% |
| Integrated company ships* | 62.7% | 58.5% |
| Conversion ratio Anchoveta MT/ Meal MT | 4.38 | 4.27 |

Figures adjusted to January 31st, 2012.
* Companies owning processing plants and fleets.
Source: Prepared by the authors based on Ministry of Production and Paredes (2012) data.

As mentioned before, introduction of individual fishing quotas created some equity problems mainly related to cost and benefit distribution in the new regime of access to this fishery, as well as to fishing fees that should be paid for the private use of a public resource. For this last issue, see section I.2). Because this new regime would create transition costs to the crews of ships that would no longer operate in this fishery, the regulation created the Compensation Fund for Fishery Reorganization (FONCOPES), an entity charged with managing mandatory contributions to the fund (US$ 1.95 per landed MT) and with implementing social programs for crew members, including Incentives for Voluntary Resignation, Labor Reconversion Programs, Development and Promotion of MSEs, and early retirement schemes. However, the regulation does not cover workers in the processing plants that also stopped working as a result of industry reorganization.

Workers and shareholders of processing plants without a fishing fleet to feed their plants were the great losers with this new regulation since their activity suddenly became economically unfeasible. Although they took their case to the Constitutional Court, they lost it, and many had to close or change their business.

In contrast, the great winners were independent ship owners who, because they owned individual quotas, they saw their negotiation power significantly grow vis-à-vis the plants that bought their anchoveta. This sudden change in the balance of power between the parties significantly increased the price of anchoveta and the extractive industry's profitability, compared to processing. Nevertheless, the story is not likely to have ended at this point.

Today, there is a very large group of artisanal fishermen who consider themselves unfairly excluded from the fisheries' bounty. Why can't they also direct their fishing to the manufacturing of the most profitable market product, that is, to IHC? This perceived unfairness or, otherwise, their wish to increase their profits, is what is causing a growing diversion of activity from artisanal fishing to residual meal and discard, reuse and waste plants. It is also increasing the regulatory chaos of the last few months. Against this backdrop, the rules of access to anchoveta fisheries need to be assessed and improved, while the catch must no longer be segregated by final use.

Regarding the possible impacts of the reform on the sustainability of the species, Paredes (2012) shows evidence that the new regulation must have created perverse incentives that encourage under reporting of landings and, even, discarding of juveniles at sea. This behavior is not only the consequence of the current regulatory framework, but also of weak institutional control and surveillance, in addition to the strong perception of corruption which -although not widespread in this sector- results mainly from weak internal processes that translate into deficient oversight, control and sanction systems.

The new fishing regime significantly increased the incentives to evade regulations and underreport landings. The present individual catch quota creates a very strong stake in making it last, further leveraged by rising anchoveta prices resulting from the new power balance in the industry. As a result, the so-called "black fishing," or underreported landings, may have increased.[3] A sign of greater underreporting is found in the evolution of the fish-to-meal conversion ratio. According to PRODUCE figures, the fish to meal ratio (in metric tons) fell from 4.40 in the five years before the reform (2004-2008) to 4.28 in 2011 (4.22 in 2010). This reduction is difficult to achieve without introducing technological changes. Even more so, the evaluation report for the first fishing season under the new regime prepared by PRODUCE mentions that the fish/meal conversion factor was 4.1 on average."[4] However, sector authorities interpreted this reduction as an indicator of better productivity derived from the new fishing regime when, in fact, it pointed to increased underreporting.[5]

An additional sign of underreporting comes from the evolution of efficiency reported for industrial fleet fishing (landing/hold capacity ratio). Paredes (2012) showed that "following the reform, the utilization percent ratio was lower than under the former regime for all kinds of ships, except one." Also, the greater reduction in reported fishing efficiency is observed in the landings by ships at plants owned by the same company. Why did integrated companies, those that have plants and fleet and have more access to resources and technology, report greater losses in fishing efficiencies? A possible explanation is the existence of collusion between ship owners and meal manufacturers, a behavior that is much easier if fleets and plants belong to the same corporate group. Then, clearly, a possible explanation for the presumed lower fishing efficiency is that underreporting of landings is driven by their desire not to exhaust individual fishing quotas (LMCE). This is easier when the ships land their catch at plants owned by the owner of the fleet. These potential problems point to the importance of reinforcing surveillance and control initiatives as indispensable conditions to improve the new system.[6]

Nevertheless, the individual quota regulation introduced innovative elements in terms of limiting the catch and contributing to the sustainability of the species. In fact, the anchoveta fishery south of parallel 16º S was always open, reflecting the premise that "what was not fished in Peru would be fished in Chile". Clearly, free access and absence of a global quota did not contribute to ensure sustainability. However, this situation changed in June 2009 when Supreme Decree No. 009-2009 the southern zone also under Legislative Decree No. 1084, and, consequently, introduced the allocation of global catch quotas in this fishing zone. In this case, efficiency and sustainability went hand in hand. Table 2 shows a reduction of fleet oversize in this area. Nevertheless, and contrary to what happened in the central-north zone, the number of fishing days fell simultaneously with greater fleet efficiency and conversion ratios. Therefore, differently from what happened in the central-north zone, there are no signs that the introduction of the individual fishing quota system in the southern coast resulting in more underreporting.

TABLE 2:
**ANCHOVETA FISHERIES INDICATORS**
SOUTHERN ZONE, 2008-2011

| INDICATORS | Without LMCE systems 2006 - 2008 | With LMCE systems 2009 - 2011 |
|---|---|---|
| Authorized fishing period | - | **2009:** Jul-07 to Jan-24<br>**2010:** Jan -25 to Jul-31/ Aug-01 to Dec-31<br>**2011:** feb-17 to Jun-30/ Jul-01 to Dec-31 |
| Number of Vessels | 427 | 307 |
| Fishing days (annual average) | 242 | 194 |
| Premium meal production % | 17% | 44% |
| Fleet efficiency | 31.9% | 33.0% |
| Steel ships | 30.5% | 31.5% |
| Wooden ships | 48.8% | 53.7% |
| Integrated company ships* | 32.4% | 32.7% |
| Conversion ratio Anchoveta MT/ Meal MT | 4.29 | 4.30 |

Figures to January 31, 2012
* Companies owning processing plants and fleets.
Source: Prepared by the authors based on Ministry of Production and Paredes (2012) data.

## Industrial or larger scale fleet

Artisanal and smaller ships fishing for DHC have always enjoyed free access to anchoveta fisheries simply by applying for a fishing permit. Differently from larger scale or industrial vessels, anyone could build an artisanal fishing ship and directly apply for a fishing permit from the corresponding Regional Production Bureau.

A first change occurred with S. D. No. 020-2006 that temporarily prohibited building of new artisanal vessels larger than 10 m3 hold capacity. Exceptionally, new ships already approved by the General Port and Coastguards Captainship could be built and authorized to operate.

Temporary suspension of new artisanal ship construction was repeatedly extended since 2006. Undoubtedly, this was the first attempt by the Ministry of Production to face an unsustainable double jeopardy. On the one hand, vessels with more than 32.6 m3 hold capacity or larger were under restrictive rules, such as hold substitution. And, on the other, vessels of the same characteristics but (sometimes minimally) smaller capacity had free unlimited authorization to fish generally, and to catch anchoveta, in particular.

Seven months after Leg. Dec. No. 1084 was enacted a significant change was introduced concerning the artisanal fleet's extractive activities. In fact, M. R. No. 100-2009 (January 2009) created a Registry of Authorized Artisanal Anchoveta Fishing Vessels for Direct Human Consumption. S.D. No. 010-2010 from July 2010, the Fishing Reorganization Regulation (ROP is the Spanish acronym) regarding Anchoveta for Direct Human Consumption, prohibited giving artisanal vessels more fishing permits for access to anchoveta fishing.

Contrary to industrial fishing, artisanal anchoveta fishing is not subjected to a global catch quota; nor do individual fishing quotas apply either. The ROP set forth by S.D. No. 010-2010 reserved an exclusive fishing zone for artisanal fishermen of five miles along the coastline.[7] Artisanal fishing for DHC does not pay fishing duties (contrary to IHC). Moreover, supervision and surveillance are weaker, even inexistent. This duality has created much disorder in the industry where increasingly presumed DHC anchoveta is diverted to IHC.

As mentioned earlier, M.R. No. 100-2009 presumably closed access by new artisanal fishermen to anchoveta fishing. This decision establishes artisanal fishing ship owners may only fish anchoveta if they have a valid fishing permit, if their vessels have insulated holds and ice boxes (one ice box for every two fish holds), if they are registered with the Regional Production Directorate or Administration of their fishing zone, and if they have signed a supply agreement guaranteeing authorized vessels will deliver their fish to a DHC processing facility. To date, and in spite of the time elapsed, the regulation has not been entirely enforced, especially in what regards follow-up, monetary and control actions.

What is the size of the anchoveta artisanal fleet? According to M.R. No. 168-2010-PRODUCE, 619 artisanal and smaller scale vessels can legally fish anchoveta for DHC. This figure, however, seems extremely small. In fact, IMARPE's 2009 update of the 2005 second artisanal fishing survey (IMARPE, 2005) estimated the artisanal fleet size totaled 10,385 ships. Even more so, the I National 2012 Artisanal Fishing Census put the fleet at 16,075 artisanal vessels (Ministry of Production, 2012), or a 55% increase in just three years. Moreover, this growth occurred although subsection 3.4 of the ROP for DHC Anchoveta (S.D. No. 010-2010) prohibits issuing new fishing permits for anchoveta. Certainly, the growth of the artisanal fleet in this period has not been only for anchoveta fishing, but it is also very unlikely none or only a negligible fraction of the increase would be accounted for by the intention of fishermen to engage in anchoveta fishing. In any case, it is not very likely that out of the more than 15,000 existing artisanal vessels, under 700 (less than 5%) are devoted to fishing anchoveta. Clearly, the informality of this fishery is large, and the capacity to effectively control it is very limited.

Recently, in August 2012, S.D. No. 005-2012 amended the ROP of Anchoveta Artisanal Fisheries. The regulation sets forth the reserve zone for artisanal fishing within five miles off the coastline. The following five miles are reserved for small ships. The industrial fleet is allowed to fish only beyond ten miles from the coastline. This regulation, which very importantly affected access to the resource by different fishing ship owners -mostly in the south where anchoveta is very close to the coastline-, was not pre-published as required in the regulation and lacks known scientific basis. Therefore, not surprisingly, it has a number of problems. For example, in its initial drafting the regulation stated that the band between 5 and 10 miles was "preferably reserved for DHC and was exclusive for the smaller scale fishing activity..." what does "preferably" means? This term was very much criticized because it led to think that smaller scale vessels could also openly and legally fish for IHC, thus weakening the current fishing structure, which prohibits artisanal and smaller scale vessels to fish for IHC.8

In spite of the fact that the scope of the term "preferably" was later clarified (M.R. No. 433-2012), enforcing S.D. No. 005-2012 faces a number of challenges: first, there is no complete register of smaller scale vessels; second, these ships do not have a satellite tracking system to monitor them, so they can fish from mile 1 to mile 15, under no control; and, third, they are not subjected to a global catch quota, nor to individual fishing constraints. As long as these issues are not corrected, the regulation may have a negative impact in terms of species sustainability, because neither the ships nor their catch can be effectively controlled along the band where the species is particularly plentiful.

This regulation negatively impacted the IHC fishing industry and the industrial fleet fishermen. According to SNP (2012) "the area beyond 10 miles where the anchoveta biomass concentrates is very small: Piura-Tumbes (15%), Lambayeque

(6%) and Moquegua-Tacna (3%)". Southern Peru has experienced the most adverse impact as meal plants get significantly less anchoveta. Moreover, paradoxically, there are no DHC plants there to take fish from smaller ships. Clearly, the regulation is faulted because apparently it has disregarded basic sector features needing regulation, such as absence of a global catch quota for the smaller scale fleet, lack of capacity to monitor a fleet lacking satellite tracking systems, absence of DHC plants in the south, among others. These issues combined with the lack of open communication gave rise to a confrontation between industry and Ministry authorities.

## 1.2 FISHING FEES

As for charging dues for fishing for indirect human consumption, the regulation that came into effect in 2006 (S.D. No. 024-2006) establishes the duty to fish anchoveta (per landed ton) at 0.25% of the average monthly FOB* value of fishmeal ton, based on official data from ADUANET. In its first final provision, Leg. Dec. No. 1084 set forth that fishing fees in force when the law was published could not be changed for a ten-year period, in spite of the fact that this law granted a substantial benefit to ship owners who held individual fishing quotas allocated for no valuable consideration. In other words, not only were these quotas allocated free of charge, contrary to what would have happened had they been auctioned off, but also the government committed to not change the fishing fees during the new regime's period. As documented in Paredes (2012) current duties are very low, both compared to other fisheries in the world and in terms of revenues earned by the private sector.

Besides paying for fishing duties, the regulation includes three additional mandatory contributions. The first is the contribution to FONCOPES, created by Leg. Dec. No. 1084, amounting to US$ 1.95 per MT of caught anchoveta.

The second is US$ 0.26 per landed anchoveta MT that was reinstated by Law No. 28193 as amended by Law No. 28320 since 2004. This is a contribution by fishing industrial companies to the Fishermen's Retirement Fund managed by the Fishermen's Social Security and Benefits Savings and Loans – CBSSP. The third one is a US$ 1.40 contribution per metric ton of anchoveta recently introduced by Law No. 30003 for larger scale fishing ships to the pension of working fishermen. This new contribution came into effect in April 2013.

An analysis of what happened in 2012 is important to have a right perspective of duties and contributions paid by the industrial fleet. With an average FOB price of fishmeal for that year of US$ 1,373/MT, the duty paid was US$ 3.43/MT, plus US$ 1.95/MT in contribution to FONCOPES and US$ 0.26/MT for CBSSP, that is US$ 5.64/MT of landed anchoveta in total. These joint contributions are

small compared to the income value of the resource transferred to private ship owners. For this calculation, the resource income approaches the rental prices per individual quotas that were transacted in the market. In the first two years of the new regime, anchoveta MT was sold for US$ 250-300 per MT and ship owners with allocated quotas transacted their quotas (not the anchoveta but the anchoveta quota) for US$ 200-250 per MT. In other words, the contribution to be paid to the Peruvian State, CBSSP and FONCOPES was only 2.25% of the value that ship owners could get from renting out the fishing rights the State had given them at no cost (Paredes 2012).

On the other hand, the duty paid for anchoveta extraction for DHC is zero. In fact, DS 005-2012 totally exempted the smaller scale fleet from duties and the General Fishing Law did the same with the artisanal fleet. The rationale behind this dual scheme is difficult to understand. Why is it that extraction duties are different according to the use of the resource? If the logic behind were fostering the country's food security, as some mistakenly state, then DHC anchoveta exports would not be subsidized by a drawback, while selling these products in areas characterized by high chronic malnutrition rate in the country receives no incentive at all. This observation shows the irrationality of the current regime. Moreover, the State does not efficiently collect duties or royalties on exports of its own resource. It actually subsidizes foreign consumption of products prepared with this resource, instead of fostering its internal sale, most of all in areas of high malnutrition rates.

The reform of fishing duties is a pending issue in the Ministry's policy agenda. As we have seen, the industrial fleet is pays only a very small fraction of the value of the public resource transferred to the private sector through the system of individual quotas and also compared to the cost of managing Peru's fisheries. Although a concrete proposal for a new fishing duties system goes beyond the scope of the study, we do want to emphasize that it is necessary to unify the various existing contributions under the current regulations and significantly increase the duties paid.

In the past, there have been alternative duty collection mechanisms for extraction of hydro biological resources, such as those created in the regime applied in Arequipa, Moquegua and Tacna through S.D. No. 003-2008, which created the Fund for Promoting Artisanal Fishing (PROSUR). This was a mechanism that allowed the industrial fleet to enter the zone traditionally reserved for the artisanal fleet (the first five miles) in exchange for economic contributions to a fund to promote development of projects for the benefit of artisanal fisheries and the families and members of the Artisanal Fishermen Social Organizations (OSPAs). The fund received private contributions equaling 0.30% of UIT/MT of landed anchoveta at the fisheries' industrial facility, which was distributed in equal parts to Regional Governments and direct disbursements to OSPAs.[9] Besides evidencing the need to conduct an environmental impact assessment of these regulations and their implementation, what this experience shows is the industry's readiness to pay more to be able

to access the resource and the tangible benefits for the players in this fishery in Southern Peru, if the resource is legally exploited.

Table 3 shows the evolution of presumed fishing duties and contributions to FONCOPES and CBSSP during the 2007-2012 period, according to the average price per meal MT exported each year. We can see that the contributions are relatively small as compared to the value of exports of this resource, but they are not negligible (particularly when compared to the Fishing Vice Ministry or IMARPE's budget).[10] What have the fishing duties been used for? The use of these resources must be transparent and ensure they are used for developing the sector and not other unrelated activities. It is critical to emphasize that it is not only important to collect revenues from fishing duties, but also to ensure the quality of expenditure and that projects and activities financed with these resources effectively contribute to the sustainable development of our fisheries.

TABLE 3:
**FISHING DUTIES AND CONTRIBUTIONS TO FONCOPES AND CBSSP**
2007 - 2012

| Years | Fishing duties (US$/TM): anchoveta for IHC (US$/MT) | Contribution to FONCOPES LD 1084 | Contribution to CBSSP | Total fishing duties (thousands of US$) | FOB value of fishmeal and fish oil exports | 5% drawback/ FOB value |
|---|---|---|---|---|---|---|
| 2007 | 2.39 | - | 0.26 | 16,137 | 1,460,175 | 73,009 |
| 2008 | 2.24 | 1.95 | 0.26 | 27,413 | 1,797,386 | 89,869 |
| 2009 | 2.38 | 1.95 | 0.26 | 26,770 | 1,683,214 | 84,161 |
| 2010 | 3.71 | 1.95 | 0.26 | 19,722 | 1,884,218 | 94,211 |
| 2011 | 3.39 | 1.95 | 0.26 | 39,187 | 2,113,460 | 105,673 |
| 2012 | 3.43 | 1.95 | 0.26 | 20,391 | 2,311,915 | 115,596 |

Source: Prepared by the authors based on Ministry of Production and SUNAT (2013) data.

It is important to point out that fees to be paid for anchoveta extraction should finance both the cost of efficiently managing this fishery - including research and monitoring of the marine ecosystem by IMARPE- and fleet and landing supervision and oversight costs. Besides they should finance activities to develop the fishing sector in Peru, including competitive funding for research and development by academic institutions and companies and compensation for negative "externalities" that extractive activity at sea and inland transformation may cause, such as a falling incomes of artisanal fishermen and other fisheries due to impacts on the ecosystem.

# 2. JUVENILE FISHING AND DISCARDS

There has recently been an increasing problem in dealing with the catch of smaller-sized fish than generally permitted in Peruvian fisheries and anchoveta fisheries in particular. Scientific research, some IMARPE reports and current authorities have pointed out that larger scale ship owners and also smaller scale ship owners today prefer to throw their catch of juveniles to the sea which, undoubtedly, plays against the sustainability of the species. This behavior by ship owners seeks to avoid administrative sanctions they would be subjected to if they landed a catch of juveniles. It also seeks to avoid the use of their individual fishing quota with low-yield specimens. In other words, under the current regulatory framework, discarding juveniles at sea, instead of processing them in land, may be profitable at the start of a fishing season, a situation that changes when the fishing season is near closing and juvenile landings increase.

Extraction of smaller specimens in larger percentages than allowed by regulations is sanctioned with a fine and, even seizure of said fishing, as corrective or redress measures.[11] Thus, the origin of the juvenile discard problem lies in the perverse incentive structure generated both by current regulations and inappropriate monitoring of fishing tasks which, in practice, do not allow identifying discard operations.

The existing regulations[12] impose the following obligations on anchoveta fishing ships:

i. Immediately suspending extractive activities in the zone in view of the presence of juveniles – anchoveta and white anchoveta fish less than 12 centimeters long – in landings above tolerable limits,
ii. Not extracting the resource beyond the maximum tolerance of anchoveta and white anchoveta juveniles set at 10% of the number of extracted fish (M.R. No. 457-2012),
iii. Informing the competent authorities where those fish were extracted,
iv. Not throwing fish to the sea once extracted,
v. Facilitating the work of observers and/or inspectors on board.

Prohibited behaviors and applicable sanctions are included in S.D. No. 019-2011-PRODUCE (TUO-RISPAC) and are summarized in Table 4 below:

TABLE 4:
## SANCTIONS FOR FISHING JUVENILES

| Infraction | Rating | Corrective or redress measure | Sanction |
|---|---|---|---|
| Extracting, processing, selling or transporting hydro biological resources in sizes or weights below set standards | Not serious | Seizure | Fine (amount of excess resource x UIT factor) |
| Not suspending extraction of hydro biological resource when smaller than permitted sizes are caught and the established tolerance percentage has been exceeded | Serious | Fishing permit suspension for thirty (30) effective days | Fine (20 UIT) and suspension of the fishing permit for sixty (60) effective days |
| Not reporting to competent authorities on catch of smaller specimens | Not serious | Does not apply | Fine (5 UIT) per each failure to report and applied as a supplement since there is no specification |
| Throwing at sea hydro biological resources from incidental catch or in sizes smaller than allowed | Serious | Suspension of the fishing permit for thirty (30) effective fishing days | Fine (8 UIT x hold capacity in m3) and suspension of the fishing permit for thirty (30) effective fishing days |
| Preventing or obstructing the work of observers or inspectors on board | Serious | Suspension of the fishing permit for thirty (30) effective fishing days | Fine (20 UIT) and suspension of the fishing permit for sixty (60) effective days |

Source: Ministry of Production – Single Conformed Fishing and Agriculture Inspections and Sanctions Regulation (TUO. RISPAC)

These sanctions are designed assuming ship owners, the regulated party, are fully informed and can handle the facts and circumstances of the prohibited behavior and know how to prevent them. However, with existing commercial technology, ship masters cannot detect the catch beforehand, or determine if the anchoveta includes juveniles or not, and even less to what extent.[13] The ship master can only find out approximately once the resource has been caught by the purse seiner and only then can he decide to discharge it in the hold or throw it back to the sea. Analyzing the regulation in terms of its impact on the ship master or fishing company's decision is crucial. What must be changed is a contradictory regulation that actually encourages ship masters to decide discarding dead anchovetas at sea.

Likewise, it is important to point out that some current provisions are general and not effectively dissuasive or manage to stop the regulated parties from repeating a prohibited behavior although they may very well do so. In fact, these sanctions are not sufficiently "precise" to dissuade offenders and reduce prohibited behaviors by the regulated parties. For example, to date, the regulatory framework has not clearly determined the zone where the fishing suspension order will be enforced by establishing a reasonable radius within which the regulated parties know they can resume fishing. Likewise, until the second fishing season in 2012, there was no detailed regulatory procedure identifying the authority to report detected juvenile specimens, the term or the means to communicate their report.

These omissions in the cases to be sanctioned encourage discretional behavior and inefficiency of authorities at the Ministry because the evaluator can only estimate if the regulated parties had sufficient information to define the area where fishing is prohibited or since when they have an obligation to report counts, among other aspects. When challenged in court, judges void them because their vagueness violates basic constitutional precepts.

Discretional behavior also opens the way to administrative corruption. If the regulations were more precise there would be less room for corrupt behavior. If control systems were more automated and depended less on the decisions of some officials, there would be less discretion. If supervisors depended less on the supervised parties and interacted less with them, there would also be less discretionary decisions. Less discretionary decisions would reduce the chances of administrative corruption, a crucial element when designing policies and passing regulations, particularly in a sector where perceived corruption has been and is a serious issue.[14]

Going back to juveniles, we must remember that, although the regulation effective since the nineties has tried to prevent the fishing of juveniles,[15] the catch of anchoveta smaller than allowed is a historical phenomenon.[16] Before 2009, probably, the volume of juveniles landing reflected the structure of incentives that was then current and encouraged the Olympic race. It also reflected the

technical inability to identify the size distribution of schools at sea. With the introduction of individual fishing quotas, the incentive structure drastically changed and, not surprisingly, the volume of juvenile landings also decreased. According to PRODUCE data, the number of infractions for extracting juveniles decreased from 315 in 2008, the last year before the reform, to 171 in 2009, the first year of the individual quota regime.[17]

In this regard, the official assessment of the second 2009 fishing season (PRODUCE, 2010) highlighted that the sanctions for fishing juveniles achieved to reduce catch by 82% compared to the same season in 2008. However, it is important to realize this occurred without any technological change that would allow identifying sizes of biomass to be fished. The authorities did not investigate why juvenile landings occurred at the end of the season. The following hypothesis may explain this pattern.

Hypothesis: At the beginning of the season, ship owners prefer not to exhaust their quota with juveniles that result in low yields and official sanctions. In this context, the implicit incentive structure in the current regulation promotes discarding. However, towards the end of the season, with few fishing days left, it is more profitable to land juveniles and pay the fines because, at current fishmeal and fish oil prices, fines are not effective way to bar this behavior.

It can be argued that the regulation also includes the seizure of juveniles, which would contradict this hypothesis. However, it is important to point out that seizure only refers to juvenile landings that exceed 10% of the total landed volume. Moreover, what we actually see is that these sanctions are challenged in court and never actually paid. Therefore, the sanctions do not fulfill their dissuasive effect and it is very likely that the proposed hypothesis reflects what has been happening in this fishery.

In this way, under the individual quota regime, it is highly probable that the new incentive structure promotes discarding juveniles at sea – see hypothesis – with the consequent lesser landing of juveniles but increasing environmental damage and thus further undermining sustainability. In fact, during this period there was no technological change that would allow to better assess the distribution of fish school sizes at sea. This, combines with the fact that most landing of juveniles comes at the end of the season, is a sign that the problem of discards at sea may have worsened in recent years and it is also likely that, due to the consequent lack of timely information about the presence of juveniles in certain areas, no fishing suspensions for biomass composition took place.

Although the idea of temporarily suspending the season or establishing specific off limits fishing zone due to an excessive presence of juveniles is, in principle, correct, the problem with correct regulations is that instead of contributing to a precautionary management of fisheries, consistent with their sustainability, they rather promote discarding juveniles at sea.[18] This perverse incentive is

due to the convergence of inadequate regulations (inaccurate sanctions and regulatory regime), misaligned economic incentives (exhaustion of individual quota with landed juveniles which, besides, generate lower yields in fishmeal manufacturing) and technical inability to monitor discards at sea from fishing ships (even if this technology is available and used in other fisheries around the world), added to the lack of the government's ability to design agile precautionary procedures to close zones immediately.

During the first anchoveta-fishing season in 2012, the information generated by the Fishing Log Program shows that most discards took place between Chicama and Pisco. The study revealed some kind of discarding in 13% of the 173 sampled coves inspected during 95 anchoveta fishing voyages (IMARPE, 2012). The main reason for discarding was the presence of juveniles, which accounts for 43% of discards. Excessive fishing was the second reason, in 22% of cases. This is very revealing information because it shows that the real problem does not lie in the juveniles landed in plants, but in those discarded at sea. In fact, discards do not happen in 13 or 10% of inspected areas but rather 2 to 3% of the catch is discarded. Therefore, the amount of dead anchoveta thrown back to sea is significant and in fact much larger than the juveniles' discarded at land.[19]

Then, it is clear that this practice should be fought. To this end, PRODUCE recently launched a Program of on board inspectors, both in smaller and larger scale vessels, with the priority objective of obtaining information on the presence of juveniles and the use of conservation systems on board.[20] Notwithstanding the costs and inefficiencies of this program for the fleet, the question is if this is the best control mechanism and if this will create an effective dissuasion of behaviors sought to be eliminated or, on the contrary, if it will become a source of administrative corruption which, in practice, would validate behaviors contrary to the species' sustainability and efficient management of fisheries.

To conclude, juvenile discards at sea increases the mortality of anchoveta, reduces the biomass and decreases the accuracy and quality of catch data, an indispensable requirement for efficient and precautionary management of fisheries. Facing this problem efficiently should be a priority in the Ministry's policy agenda. Elements in the regulatory framework must be amended that run against achieving this goal, because as they are now, they create perverse incentives that foster behaviors that need to be eradicated. Timely catch reporting must be encouraged and severe and significant penalties be introduced to punish recurring fishing in prohibited zones.

# 3. PLANTS FOR PROCESSING RESIDUAL MEAL AND DISCARD AND HYDROBIOLOGICAL SOLID WASTE REUSE

Leg. Dec. 1084 sought to eliminate inefficiencies caused by the Olympic race, and plants and fleet industry over size. Although the regulation has gradually reduced the excess number of ships, it did not include any mechanisms to reduce the number of plants, which was supposed to happen endogenously as concentration increased in the industry. Although the number of large effectively operating plants has dropped, there was no consensus to promote closing and dismantling of excess plants and most permits are still valid. The importance of fighting this phenomenon is that fishmeal plants are the source of demand for anchoveta caught by the fleet and if we want to effectively control anchoveta fishing, it is necessary to control and monitor the plants. Evidently, it was not logical or desirable to see the number of plants increase under the new regime.

In fact, given the existing excess of installed capacity, the installation and increase of plant capacity for making standard and high protein content fishmeal was prohibited many years ago. In 2001, M.R. No. 218-2001-PE established that permits for fish processing for indirect human consumption would be granted only for residual fishmeal plants. This became the new backdoor to expand inland processing capacity and increase anchoveta demand for IHC.

Analyzing the regulations governing small industrial plants – residual and solid waste reuse plants – shows in recent years PRODUCE has passed a number of regulations that have worsened the problem of diversion from artisanal fishing to IHC. For example, between 1995 and 2007, 18 permits were approved for this kind of plants and approximately 25 new residual plants were installed since 2008 in which individual fishing quotas were introduced for the fleet![21] The problem lies not only in not abiding by the law or paying less fishing fees – because artisanal activity is not taxed by this duty – but also that anchoveta artisanal fishing is not subject to a total catch quota and, with the demand generated by this kind of plants, there has been an increase in the artisanal fleet devoted to anchoveta fishing, no matter if they have a permit or not, because no permits are needed to get into illegal practices. Looking forward this can seriously weaken the fisheries reorganization that Leg. Dec. 1084 sought to accomplish.

The first to be mentioned among these regulations is M.R. No. 043-2005 that permitted residues and waste generated in artisanal fishing docks (DPA) to be

processed in fishmeal processing plants for IHC, including residual meal plants. Besides, it established that in DPA zones where there were no processing plants, residue and waste processing plants could be built and their installed capacity would be directly related to the amount of residues generated with a maximum capacity of 5 t/h throughput of residual raw material. Although in theory this regulation might have some economic rationale, in Peru -where supervision and control capacity is very weak or almost absent for artisanal fishing – it is not easy for authorities to tell apart residual from recently landed fish so this regulation weakened the system by increasing demand of anchoveta for IHC from artisanal vessels.[22]

Then, Ministry Resolution No. 205-2006 provided that waste treatment systems, that are different from residual fishmeal plants, would be a way to reduce the environmental impact of waste from DHC processing plants that had no residual fishmeal plants, such as those resulting from DPA selection and discard, or other sources of waste. Article No. 6 even specified places where those plants could be installed, including Talara, Paita, Chimbote, Ica, Arequipa and Ilo, with total capacities of 10, 20, 10, 10, 10 and 10 t/h, respectively. In 2009 this article was amended by M.R. No. 431-2008 that allowed increasing plant capacity in already existing plants and added the Sechura and Sullana zones, although there were already residual meal plants in Paita, Chimbote and Ilo. Again, the current legal framework was being forced to allow establishing more IHC plants. In fact, according to a report by Peru Pesquero (2011), three meal plants were installed in Paita, three in Chimbote and two in Pisco after this decision and, instead of processing solid waste from artisanal and market docks for which they were created, they exclusively process fishmeal using whole fish from artisanal fleet anchoveta landings as raw material.

Recently, the Regulation on Hydro biological Resource Discards and/or Waste Processing (S.D. No. 005-2011), amended a few months after its enactment by S.D. No. 017-2011 and then again by S.D. No. 005-2012, and presumable aimed at preventing environmental pollution, provided that the sale of all hydro biological resource waste and discards would take place both in residual meal plants and reuse plants. Besides, owners of plants to process materials for direct human consumption were permitted to aim up to 40% of all the anchoveta they received to produce residual fishmeal.

From our perspective, it is necessary to determine with scientific rigor, which is the true yield factor of anchoveta in different processes for direct human consumption. Naturally, the factor is not the same to prepare preserves, and frozen or cured fish. If the yield standard is not defined first, based upon which technical considerations can the Ministry of Production determine what percentage of received resources may reasonably be aimed at producing residual fishmeal?

Ministry Resolution No. 201-2010 by the Ministry of Production created the "Assessment Program for Industrial Facilities for Direct Human Consumption

Fisheries," with the purpose of determining the yield standard of anchoveta for direct human consumption (canned), which should have been fixed through a Directorate Resolution by the current General Fisheries Extraction and Processing Directorate. However, this regulation, as many others, has become dead letter, since the Ministry of Production has not yet determined the time factor in the preamble to M.R. 201-2010.

In any case, smaller scale vessel owners can currently aim 10% of their fishing to indirect human consumption, by declaring it is not appropriate for direct human consumption.[23] Then, at the plant, industrial facility owners may aim 40% of received resource to produce fishmeal. Then, DHC anchoveta processing starts with only 50% of what is supposedly caught for DHC. This process creates residues (up to 30-40% of what enters the production line, depending on the type of product), which are also aimed – and correctly so – to meal production. Therefore, in practice, the percentage of catch by the fleet supposedly going for DHC is nearly about one third of the landed total.

It is necessary to challenge the rationale behind the regulation on processing hydro biological resource discards and/or waste, which presumably promotes the efficient use of anchoveta in the DHC subsector by using resources at different extraction and production stages. It is actually being used to cover up what are clearly illegal activities. Those who consider it is convenient to continue segmenting the sector in two subsectors, IHC and DHC, may argue that this regulation is some sort of "Trojan Horse" that will eventually lead to reorganizing anchoveta fisheries by substantial reform, and thus ensure the sustainability of this renewable resource. In fact, the extremely unstable Ministry regulation opens loopholes that further weaken the existing system and, inadvertently or not, promote increasing diversion of artisanal fishing to IHC. We feel regulations should take into account the State's true oversight and control capacity, now weak and limited.

As we have seen, the regulation on individual quotas opted chose not to refer the required reduction of excess installed capacity, hoping it would happen without additional intervention or regulation. In practice, this vision has led to a situation in which plant owners do not have legal instruments for example to request the suspension of operation permits until they decide what to do with their excess installed capacity. Evidently, no incentive has been created to definitely reduce this excess of processing capacity. It is desirable to reduce the number of processing plants because it reduces the potential demand for the resource, and the need for supervision and surveillance.

Even if Leg. Dec. No. 1084 made some progress in reducing the number of operation permits for the excess plants, industrial reuse and residual meal facilities became the demand drivers for fresh anchoveta extracted by artisanal and smaller scale vessels, which, according to regulation, should be aimed

at DHC. Undoubtedly, if these establishments were appropriately monitored and controlled, fresh anchoveta diversion would be lesser and the Ministry of Production would correct this dark market fostered by its deficient surveillance. Clearly, when we refer to surveillance, we do not only mean plant inspectors, but a modern and comprehensive supervision system covering the entire extraction, production and distribution chain, including ex-post analysis of information on catches, landings, production, sales and exports.

Notwithstanding the above, article 4º in S.D. No. 005-2012-PRODUCE introduces a measure that is peculiar and contradictory, to say the least. In fact, this regulation forbids the reuse of new hydro biological resource discard and fishery residue industrial facilities. Immediately afterwards, it determines that construction of those plants can be exceptionally authorized for biological, technical and economic reasons.

In practice, the ban is watered down by the rule of exception which can unfortunately be used to continue blurring the system. In other terms, this exception is the backdoor for new plants to engage in processing fresh anchoveta to produce fishmeal as if they were for discard reuse while hydro biological waste processing plants continue to be built.

# 4. CONTROL AND SURVEILLANCE SYSTEMS

Concerning supervision and control of anchoveta fisheries, there are currently two main methods of control: (i) control of extraction activity through satellite tracking systems and on board inspectors programs such as the one recently introduced by the Ministry of Production; and (ii) control of landing activity or supply of anchoveta to plants through the weighing in hoppers and by plant inspectors. A number of deficiencies in both fields need correction, because they do not dissuade undesired behaviors and because they hamper efficient and sustainable exportation of the resource, as provided for in the existing regulations.

## 4.1 FLEET OPERATION CONTROL AND SURVEILLANCE

Although the Satellite Tracking System – SISESAT - regulation (S.D. No 026-2003) was passed ten years ago, to fight illegal depredatory fishing, to date the SISESAT systems cannot provide agile information from the National Fisheries Authority's data processing center, and do not effectively identify and dissuade prohibited behaviors such as discards at sea. Besides, smaller scale vessels do not have the system yet and, even worse, PRODUCE has not made progress in correcting the serious organizational design problems of the current system, where regulated entities select and directly pay the supervisor, so supervisors compete with each other to provide "a better service" to their clients.

The Satellite Tracking System (SISESAT) is a geo-positioning instrument that all owners of larger scale vessels are mandated to install in their ships. Presumably, it is also mandatory for smaller ships, although the authorities have not taken any steps for this to happen. This system allows provides information on the ship's location and speed, shows the ship's route during fishing. The path and location data allows authorities to determine if the vessel is or not fishing.

Three companies supply this Satellite TrackingSystem.[24] They have been providing their services since February 1st 2007 and they should have concluded on January 31st 2010, but they continue operating to date due to successive extensions granted by the Ministry of Production. The terms of reference are presumably being prepared to buy a new Data Center, a SISESAT Control Center and Tracking and Control Software for fishing vessels, but the new regulation published by PRODUCE for public comment does not correct the serious organizational design problems of the current system which make it an ineffective control instrument.

The following are some of the main problems of the current Satellite Tracking System:

- Obsolete (unidirectional) technology that does not permit interacting with the vessel because it only sends position information at the scheduled one hour intervals.
- It still operates with 4 systems: one per supplier, in addition to integration software which was acquired but has not worked as required, because of data integration problems among the 3 suppliers. To 2011, vessel monitoring was distributed as follows: CLS monitors approximately 650 vessels, Megatrack 380 and Geosupply 300.
- There is no integrated control of vessel data, satellite terminal status, quota control or catch statistics.

RISPAC sanctions determines a vessel gets its fishing permit cancelled if: (i) there is a false SISESAT beacon on board; (ii) if SISESAT equipment is installed in another vessel, platform or if there is a device that sends false position signals; or (iii) if tampering with SISESAT positioning signals causes the "freezing" of the vessel's geographic position. The question is therefore how many fishing permits have been cancelled in the last ten years for these reasons? None to our knowledge, although we acknowledge no statistics in this regard are available. One, two or even three permits may have been cancelled in all these years, but the entrepreneurs and advisors interviewed for this report are clear that many fishing permits should have been cancelled for the above reasons. In fact, then, this is an ineffective system that does not fulfill its mission to cancel undesirable behaviors.

The Ministry of Production publishes in its website the list of fishing vessels with no sailing authorization for fishing because they have not sent a satellite signal for more than 24 hours or because they have not broadcast any signal in an interval of two hours when operating outside ports and docks. In this last case, the SISESAT equipment has to be sent for a technical inspection by the service supplier under the supervision of an inspector from the local Regional Production Directorate.[25] Table 5 shows the increase in the number of fishing vessels prevented from sailing for not sending a satellite signal for more than 24 hours from 10 in 2008 to 160 in 2012. It is remarkable that in 2013, 412 vessels were stopped from sailing, almost three times the number reported in 2012 and six times the number reported in 2011. Either, there are more infractions or there has been a change in reporting the infraction following the clash between industry and authorities. The second explanation is more likely and it shows how little effective SISESAT was in the last years due to the collusive behavior between inspectors and those they supervise.

On the other hand, ships that did not emit satellite signal for an interval longer than or equal to 2 hours remained at 30 per year on average without any abrupt changes. Interviews with industry players lead to think that some of these sanctions do not prevent and, on the contrary, hide other prohibited conducts

-such as fishing in prohibited zones- due to collusion between inspectors and the regulated ships. In any case, the weakness of this instrument to contribute in effectively managing fisheries is not so much due to the current system's technology but to the already mentioned organizational design problems.

TABLE 5:
**FISHING VESSELS PREVENTED FROM SAILING TO FISH**

| Year | No satellite signal for more than 24 hours | | | No satellite signal for more 2 hours |
|---|---|---|---|---|
| | CLS | MEGATRACK | GEO SUPPLY | Nº Vessels |
| 2008 | 2 | 2 | 6 | - |
| 2009 | 17 | 14 | 3 | 39 |
| 2010 | 17 | 13 | 4 | 14 |
| 2011 | 24 | 13 | 32 | 32 |
| 2012 | 108 | 42 | 10 | 28 |
| 2013* | 204 | 184 | 24 | - |

*Information updated to 04-15-2003
Source: Ministry of Production

After ten years with no significant changes in monitoring, control and surveillance of fishing activities, the Ministry of Production published a more detailed and ordered Draft Supreme Decree on the new SISESAT regulation. The following are the main amendments: supervision costs for SISESAT use will be paid by fishing permit holders; equipment will be supplied though rental contracts with fishing permit holders; satellite data will be delivered by onboard equipment to the Ministry of Production's SISESAT Control Center; the equipment will be two way technology – no longer one direction, as required in D.S. No. 018-2004 – to allow the Ministry to request positioning signals from vessels when no satellite signal is received; the tracking device will send the vessel's position messages every half hour, as compared to every sixty minutes before, and every three hours when off port, as compared to six hours formerly; the time elapsed between the last position message send by the vessel and its reception at the SISESAT Control Center will be less than or equal to five minutes, as compared to 60 minutes formerly; the equipment will have a memory of at least two megabytes to store positioning information over more than three months.[26]

However, as mentioned before, the new regulation proposed by PRODUCE keeps the same organizational design through which supervised companies hire supervisors and supervisors compete to attract clients. What kind of competition is this? What supervision level can be expected? In spite of any technological improvements that might be introduced, if current organizational design deficiencies are not corrected, they will generate perverse incentives for supervisors and the system will probably continue to be an ineffective instrument for fisheries management.

## 4.2 CONTROL AND SURVEILLANCE OF LANDINGS AND PLANTS

In 2003 S.D. No. 027-2003 created the "Sea Fisheries and Landing Surveillance and Control Program (PVCPDAM)" to fight illegal fishing and oversee correct operation of weighing electronic equipment to prevent under reporting of landings. PVCDPAM was the first coordinated effort by the Ministry of Production to comprehensively manage monitoring and control of extractive and processing activities, mainly of fishmeal anchoveta.

The program involves the Ministry of Production's administrative authorities, the inspection companies and the controlled parties. Because too much staffing would be needed to control every landing point, the Ministry of Production outsources this job to two private companies -SGS and CERPER- so every fishmeal plant could be under control.

SGS and CERPER inspectors retain all the attributions of a Ministry of Production inspector. They can draft an incident report for administrative

infractions, thus triggering the sanctioning administrative procedure without further notification by the Ministry of Production.

Sampling the composition of landings is one of the most important inspection functions. It helps to identify the portion of juveniles and the presence of incidental catch, that is, species other than those aimed at. Sanctioning administrative procedures for juveniles or non-authorized species start with the occurrence report.

However, PVCDPAM is not limited to inspections by the Ministry of Production or outsourced companies. In fact, the hopper weighing system has become automated lately to reduce human interventions at landing and prevent tampering with scale readings.[27]

The landed fish is sent through underwater pipes to the plant. Scales control weight. The scales used are hopper batch scales calibrated at least twice a year by companies certified by the Institute for the Defense of Competition and Intellectual Property (INDECOPI). They send a real time email report recording the landing's characteristics, including vessel, registration, starting time, ending time and weight. Handling of the scale by unauthorized persons outside the operation is not permitted, not even Ministry of Production, SGS or CERPER inspectors.

Also, S.D. No. 002-2010 expanded the scope of PVCPDAM to fisheries plants with permits to make residual fishmeal, providers of solid waste services, and DHC plants that use fishmeal plants to process their waste and discards. However, De la Fuente et al. (2011) point out that progress so far has been very small, because a number of critical aspects have not been regulated such as system financing and control instruments to be installed in the plants.

Some system detractors aim at the potential existence of conflicts of interest among supervising companies, because landings are inspected by two companies that also certify fishmeal and their main clients are the regulated companies. Although this double role is not forbidden by law, fishmeal certification is a larger business than controlling these companies and this has been a source of suspicion. The relevance of this questioning may be analyzed but the problem is more complex. The landing surveillance system should be part of a high technology chain of custody, particularly concerning the scales and data transmission, to reduce discretionality and systematically corrupt behavior. A significant improvement of control mechanisms would undoubtedly contribute to reduce problems such as fishing under reporting and "black" fishmeal production which apparently is not negligible (see Paredes, 2012).

The control and surveillance agenda includes expanding, implementing and consolidating the program in small scale fisheries and in DHC production. Although the program regulations have expanded to cover them too, we

consider they are pending of consolidation. Likewise, it is necessary to review the experience after its first ten years.

Generally, it is necessary to review the institutional framework for control and surveillance, because it involves several public and private institutions, and government levels (national and regional), whose activities should be better classified and coordinated. Besides, it is important to improve regulatory design to prevent sanctioning poorly defined infractions that otherwise and will continue being challenged at court, resulting in impunity.

Finally, the cost structure of different monitoring and control programs and those that can be implemented in the future should be taken into account to allow diagnosing different components in the cost of managing this fishery and also monitor expenditure and contribute to define the fishing duties and/or contributions required to finance anchoveta fisheries' administration. It is important to analyze the legal status of these contributions so their design will not result in further court challenges or questioning regarding access to market and conflict of competence rules.

# 5. SANCTIONS

In every control system, sanctions deal with the participant's failure to comply with their duties. Fisheries are not different. The Sea Fisheries and Landing Surveillance and Control Program described before deals with monitoring and control. Punishment and corrective measures apply for non-compliance. These measures are comprised in the regulations under the General Fishing Law (S.D. No. 012-2011-PE) and the Regulations on Fisheries and Aquaculture Inspections and Sanctions (RISPAC) (S.D. No. 016-2007) summarized in its Single Conformed Text (TUO RISPAC), enacted by S.D. 019-2011.

The TUO RISPAC comprises the regulations related to the sanctioning administrative procedure in the fisheries sub sector and details the infractions and their corresponding sanctions. The sanctioning regime for the fisheries activity has some legal gaps and infraction classification errors that need to be corrected for more efficient and effective enforcement. It is necessary to review the calculation formulas established in RISPAC to determine sanctions, so they will effectively discourage prohibited and undesired behaviors, as with discards.

The TUO RISPAC includes infractions to the Maximum Catch Levels per Vessel in S.D. No. 013-2009-PRODUCE as follows:

a. Carrying out fisheries or aquaculture activities without concession, authorization, permit or license or if they are suspended or are carried out without signing the corresponding agreement or if a Maximum Catch per Vessel (LMCE) has not been allocated.
b. Exceed the authorized Maximum Catch per Vessel (LMCE) and the approved tolerance margin.
c. Start landing of hydro biological resources without the presence of the Certifying/Supervising company inspectors appointed by the Ministry of Production to control LMCEs.
d. Extract hydro biological resources with a vessel that has included its Maximum Catch Percentage per Vessel (PMCE) definitively to another ship belonging to the same ship owner or to an unnamed vessel to fish during the fishing season.
e. Carry out extractive activities in the southern zone without having previously extracted LMCE's minimum percentage in the north central zone, as required by the legal provisions.

Generally, sanctions for storing, selling or transporting hydro biological resources during bans, as well as extracting, processing, selling or transporting hydro biological resources in sizes or weights lower than established –juveniles and incidental catch- are not sufficiently costly to discourage these behaviors. Infractions in the fishing sector have decreased at an average annual rate of 35% during the last four years, from 4,549 in 2009 to 1,264 in 2012,28 mostly

those aiming at IHC hydro biological resources for DHC (-88%), breaking or removing security seals from SISESAT equipment (-98%) and fishing without a permit (-77%). However, between 2009 and 2012, infractions for extracting hydro biological resources in smaller sizes tripled.[29] Infractions due to impeding or obstructing follow-up, control, inspection and supervision increased significantly. Infractions doubled for fishing without SISESAT registered equipment or for having a fake SISESAT beacon.

Recently published information from the Ministry of Production mentions "fines imposed due to infractions by fishing companies reached 479 million nuevos soles –to April 15, 2013- including pending, in court and appealed sanctions". This is more than sixty times the budget allocated by PRODUCE to supervision and control, which amounts to S/. 7.5 million. "Out of all the sanctions, 75% are appealed and 61% go to court. Chances are that they will not be paid in the long term or, if paid, it will take five (5) years to get them paid, given the time needed by the administrative and judicial processes".[30]

The amount for unpaid sanctions seems is difficult to assess, because the figures provided by the authorities vary significantly. For example, the Ministry of Production stated that unpaid sanctions exceeded S/. 891 million in the second half of 2011, or double the amount the present Minister has recently announced. However, according to the Ministry of Production's Foreclosure Proceedings Office, 2,287 sanctions were not paid in the last ten years, amounting only to S/. 170 million.31 On the other hand, according to the Sanctions Appeal Council, appealed sanctions from 2004 to 2012 reached 6,604, of which 86% were appealed after L. D. 1084 was enacted. Of all the sanctions, 3,956 were fines of which 65,857 UITs were still pending in 2012, totaling S/. 240 million; and 2,648 are suspended. The following table shows the main appealed infractions connected to issues in this research.

## TABLE 6:
## APPEALED SANCTIONS BY TYPE OF INFRACTION TO 2012

| Infraction Type | | Current Sanctions | | Suspended Sanctions Nº | Total Nº |
|---|---|---|---|---|---|
| | | Nº | Amount in UITs | | |
| Access | Storing hydro biological resources for DHC in inadequate conservation conditions leading to deterioration | 1 | 3 | - | 1 |
| | Building vessels without a permit to increase the fleet | 14 | 90 | - | 14 |
| | Landing currently banned hydro biological resources | 7 | 302 | - | 7 |
| | Extracting from reserved or banned areas | 1,847 | 37,271 | 21 | 1,868 |
| | Extracting hydro biological resources using non-authorized fishing tackle | 5 | 483 | - | 5 |
| | Extracting HR with a suspended fishing permit | 50 | 1,294 | - | 50 |
| | Extracting resources exceeding authorized hold capacity | 518 | 5,798 | 3 | 521 |
| | Extracting banned HR | 25 | 398 | - | 25 |
| | Exceeding the authorized maximum catch level per vessel (LMCE) and tolerance margin | 2 | 8 | - | 2 |
| Juveniles | Extracting small HR | 247 | 915 | 26 | 273 |
| | Processing small HR | 74 | 481 | - | 74 |
| | Exceeding the established catch percentage of related or dependent species | 9 | 29 | - | 9 |
| | | | | | |

| Infraction Type | | Current Sanctions | | Suspended Sanctions Nº | Total Nº |
|---|---|---|---|---|---|
| | | Nº | Amount in UITs | | |
| Access | Building a processing plant without permit | 10 | 139 | - | 10 |
| | Processing HR when the permit is suspended | 4 | 50 | - | 4 |
| | Processing banned HR | 79 | 2,000 | 1 | 80 |
| | Processing HR with no permit | 25 | 278 | 1 | 26 |
| | Open air drying of fish solid waste | 1 | 2 | - | 1 |
| | Tampering with or de-calibrating weighing instruments | 17 | 1,953 | - | 17 |
| | Landing HR without weighing instruments | 1 | 10 | - | 1 |
| | Landing HR without supervision by an inspector | 1 | 2 | 1 | 2 |
| | Impeding or obstructing follow-up control and inspection | 68 | 215 | 1 | 69 |
| Juveniles | Infringing weighing instrument requirements | 292 | 458 | 3 | 295 |
| | Failure to send GPS signal | 70 | 1,283 | 2,068 | 2,138 |
| | Fishing with non-operating SISESAT | 5 | 141 | 3 | 8 |
| | Fishing without SISESAT | 12 | 58 | 3 | 15 |
| | Supplying incomplete or incorrect information | 40 | 23 | - | 40 |
| | Varying fishing speed and route | 38 | 600 | 489 | 527 |
| **TOTAL Sanctions 2004-2012** | | **3,956** | **65,857** | **2,648** | **6,604** |

Updated to December 31, 2012
Source: Prepared by the authors based on Ministry of Production – CONAS data.

The most important are appealed infractions for extracting hydro biological resources in reserved or banned areas (1,868 pending sanctions totaling S/. 136 million), extracting volumes larger than the authorized hold capacity (521 sanctions totaling S/. 21 million), tampering with or de-calibrating weighting instruments (17 sanctions for S/. 7 million), not sending GPS signal (2,138 sanctions for S/. 5 million), extracting and processing hydro biological resources of smaller sizes (347 sanctions totaling S/. 5 million), varying fishing speed and course (527 sanctions for S/. 2 million) and for fishing without an operational SISESAT (8 sanctions totaling S/. 515 thousand).

Regardless of the exact amount of the debt for sanctions, the following should be highlighted: (i) their amount is significant; (ii) if sanctions are not paid and can be evaded, the entire control system fails and loses effectiveness, because if there is no punishment (and instead there are advantages) for engaging in forbidden behaviors, the regulatory framework (particularly infractions and sanctions) is not dissuasive and fails to accomplish its goals; (iii) evidence on appealed and unpaid sanctions shows that sanctioning undefined behaviors is a problem that needs correction, because most of these cases are taken to court; and (iv) the fact that Ministry of Production authorities mentioned different figures on the amounts due for sanctions is evidence of much inefficiency and disorder. Evidently, in such circumstances, many will decide not to pay.

Money from sanctions could finance more supervision and control along the coast, but the regulation generates perverse incentives for the companies and ship owners to appeal and challenge sanctions in court. In this field, reform requires a cost-benefit analysis of sanctions to private agents, to design truly dissuasive sanctions. To date, only one sanction included in RISPAC considers suspending the fishing permit. The quota system will work efficiently and consistently and ensure species sustainability if offenders face a true risk of losing their individual quotas. Therefore, the sanctioning system should be assessed and perfected.

Additionally, corrective measures that go together with administrative sanctions have to be reviewed to assure correction of inadequate behavior. This is vital when the environment is at stake, as when untreated or partly treated effluents are thrown to the sea.[32]

Besides, article 4 in S.D. 015-2007 created the sanction registry to be managed by DIGSECOVI to supervise and sanction non compliance with existing regulations. However, its lack of effectiveness is evident because the number of artisanal ships that break the law by diverting their anchoveta to the production of residual fishmeal has increased significantly. Excess enforcement of this discretionary judgment has also generated corruption within DIGSECOVI, though not limited to this agency only. Therefore, both regulations

and systems to tighten discretion and the institutional framework of surveillance and control need review. In fact, there are many proposals to set up a National Fishing Superintendent in the model of other regulators such as OSIPTEL, OSINERGMIN and OSITRAN.[33] The experience of keeping control and sanction functions separated from regulatory functions has been successful to promote independence and effectiveness through precise and agile laws that design good sanctioning procedures to allow proper execution and collection.

# 6. REGULATIONS AND GOVERNANCE

The fisheries regulatory framework is scattered and unpredictable. There are no publications for public comment nor specialists or scientists participating in designing the regulations. This problem has worsened by the extremely high turnover of senior officials at the Ministry. All these problems are reflected in the informality and impunity prevailing in this industry, as well as in the institutional set up problem.

There are distortions that have not permitted to close fisheries and allow access only to replace lost hold capacity, a consequence of regulatory dispersal, as mentioned in section I. In the last twenty years, every regulation that closes access to fisheries opens other doors, through similar or lower hierarchy regulations, that open access to new players. Sanctions are likewise dispersed. Only recently the RISPAC TUO in 2011 created a single regulatory body that lists infractions, and records the corresponding sanction and the corrective or redress measure. Unfortunately, this list does not include infractions from other industry regulations. Besides, some of the listed breaches are vague and sanctions are very likely to be challenged in some administrative or judicial process that will result, years later, in a ruling against the sanctioning party.

Regulations are also scattered and contradictory concerning industrial fisheries, residual fishmeal plants, discard and waste reuse and, even DHC facilities. In fact, the opening of new industrial fishmeal plants was banned and then, a few years after, some were opened even where installed capacity was excessive, as is the case of the Chimbote port. Many of these plants are now not operating. Their permits should expire and gradually they should be closed. Redressing their environmental impacts should be promoted.

In the case of residual fishmeal and discard and waste reuse plants the situation is worse because the regulations are scattered and contradictory, but there is also an evident and alarming absence of a monitoring and control authority. Factories work without an operation permit; others are off limits to authorities because owners bar entry, others with residual fishmeal permits produce premium fishmeal, among others. Canning plants are not different. This industry has been affected by innumerable changes in the regulations, which have discouraged investment. One of the main problems relates to the lack of raw material for processing, since anchoveta is diverted to IHC because of regulations that allow opening residual plants.

Many of the regulatory problems described in this document are a consequence of the lack of an appropriate law-making technique reflected to a large extent by the many years of contradictory, scattered and differentiated fisheries regulations in Peru. It is also due to a lack of dialogue and previous consultation

when preparing the regulations, which has contributed to instability and lack of regulatory predictability. This lack of dialogue has also contributed to the problem of poor enforcement of some regulations, because some are based on erroneous assumptions of what regulations fisheries need.

Clearly, it is not possible to efficiently regulate an economic activity if its processes and practical development are not known, and even more so if it is a very dynamic activity, such as fisheries.

Additionally, high turnover among senior officials –Ministers, vice-Ministers and General Directors- in PRODUCE has severely undermined this sector and the knowledge required to regulate this industry, as well as productivity at the Ministry. To date, there is not a single fishing engineer or marine biologist among PRODUCE's senior ranking officials to contribute their experience and knowledge in implementing long- or short-term fishing policies. Besides, in the last 20 years, many Fisheries or Production Ministers appointed by different administrations were not familiar with the fishing industry though they were its presumed leaders. When they started to learn about it, they were simply replaced by a new one. A similar situation is recorded where five (05) different Fisheries vice-Ministers were appointed in 2011 and 2012, that is, an average of one every four or five months. In the Economy and Finance Ministry this is very different. The current Minister was a vice- Minister for several years and the current Economy vice-Minister has held this position since August 2011 and has worked at the Ministry for many years. The same goes for the main fisheries in the world, where top officials and technicians are very specialized government workers and have held their positions for long periods during which long-term strategic sector policies can be implemented.

Not surprisingly, in this context, the fisheries industry is very informal and does not comply with regulations and sanctions. Certainly, lack of predictability, absence of dialogue, deficient law-making, interference from other sectors and government levels, as well as high turnover of officials create a vicious circle that is difficult to break. This vicious circle is the ideal scenario for corruption and for unfettered extraction and fines that will never be paid. Some players even operate illegally for short periods making significant profits. This betting on illegal activities is profitable because the State does not perform its monitoring and control role, other authorities interfere –the Judiciary, the Legislative Branch, Regional Governments. Consequently, these illicit activities can continue unaffected.

Interference from other authorities in anchoveta extraction merits attention. The Judiciary's interference has undermined fisheries sustainability. Some judges make decisions granting administrative rights to third parties which are the exclusive competence of the Ministry of Production, without knowledge on how access regimes or individual quota rights are allocated. Some judges have

even gone so far as to allocate individual ship quotas or recalculating allocated quotas. Clearly, these rulings collide with the Ministry of Production's power to allocate fishing administrative rights. Political will and dissemination of current regulations are required for this situation to change, so that judges clearly know how the Ministry operates before granting a fishing administrative right and so they know what the consequences of their rulings are.

Interference from the Legislature has also opened, although to a lesser extent, a back door for creating special regimes of access to fisheries, something that must be avoided in future as this fishery has been declared as fully exploited for more than twenty years now. It should be understood that adding players to fisheries by means of a law openly collides with the principles of sustainability and responsible fishing that FAO promotes. This is why it is important to promote dissemination of current fisheries regulations and to inform the Legislative Branch with relevant statistics and studies on how negative its participation has been in the last years, a situation that should also be communicated to public opinion at large.
Regional Governments involved in fisheries' control and surveillance along their coasts has led to corruption. Many Regional Production Directors in different Regional Governments have been indicted to date. In addition, no national policies correctly regulate the devolution of fisheries' regulatory role from Central Government to Regional Governments, in an activity which, due to its size, where regulation and control should be shared. The Central Government should preserve its regulatory, control and sanction powers supported by Regional Governments, with collected resources transferred to Regional Governments based on targets and productivity criteria.

Finally, the question about having a Ministry of Fisheries comes back again. The question is if such a ministry should be created based upon the need for specialization or if all ministries related to production should be grouped under the same institution with specific Monitoring and Control Superintendents, apart from promotion and regulation roles due to the specific nature of each activity. We consider that regardless of keeping the vice-Ministry of Fisheries within the Ministry of Production or not, a National Fishing Superintendent is needed, replicating the model of other government oversight organs. New and professional staff is needed to effectively monitor and oversee industry.

This debate on the institutional framework is very significant for IMARPE, because its strong dependence on PRODUCE can lead to challenging its decisions. In fact, its decisions are questioned and technical and scientific criteria are disregarded when its recommendations should actually prevail. IMARPE should report to the Presidency of the Council of Ministers or the Ministry of the Environment but not to PRODUCE, since IMARPE fixes the technical and scientific criteria for industry regulation. Additionally IMARPE's budget should be increased. This is possible through rational progress in reforming fishing fees. We need to strengthen IMARPE and ensure its independence. It should become a world-class scientific institution whose work can generate the necessary knowledge to contribute to the efficient and sustainable management of Peruvian fisheries.

# 7. CONCLUSIONS AND POLICY RECOMMENDATIONS

This paper has extensively revealed the severe issues facing the regulation of anchoveta fisheries. Fishing policies and regulations of the last 20 years lack internal coherence and have not been very predictable. Since no clear sustainability goals have been proposed, regulations have oftentimes endangered sustainability instead of strengthening it. Fishing policy and regulations are also hurt by the high turnover of policy makers and interference by other government branches and agencies, leading to disorder, corruption and, hence, incentives for illegal activities those regulations make profitable.

Regulations are dispersed, volatile and inconsistent. The industry's institutional set up is weak, and qualified and experienced human capital is insufficient, a surprising fact because Peru's fishing industry should be world class. The objectives of the fishing policy have not been very clear. Although for many years it has been said that the fisheries policy objectives are ensuring food security for Peruvians, there is no logical or moral support for this proposition when we realize exports of hydro biological products for DHC en subsidized have for almost 50 years through the current drawback and the former CERTEX provisions and that tax revenues were to subsidize fish consumption for the population at high risk. How to achieve food security in a small, open and globalized economy like Peru?

We list below the main conclusions and policy recommendations from this study. Because of time and scope constraints, we include only some central guidelines for policy debate in this industry, in view of the insufficient knowledge prevailing among those involved with this issue. As before, we start with a brief discussion of sector policy objectives and instruments.

## 7.1 SECTOR POLICY OBJECTIVES AND INSTRUMENTS

It is essential to have clear and coherent policy objectives. Instruments such as access regimes, fishing rights, control systems, sanctions and others require evaluations concerning their efficiency in achieving their proposed objectives. A rational policy must clearly identify objectives and the corresponding instruments to reach such objectives. In this regard, it is essential to avoid the usual mistake of having more objectives than instruments. Such misalignment leads to unstable policies, because a few instruments are not enough to accomplish all the proposed objectives and then, when seeking to attain every objective, policies become unstable, as we have already seen.

The central policy in fisheries should be straightforward and stable along time and focused in promoting efficient and sustainable development of our fisheries. Promoting food security, promoting employment, or increasing value added products

are not objectives of a fisheries policy. Considering these objectives as policy goals creates confusion, instability and, most of all, inefficiency. Even worse, they are not coherent with the general economic policy framework that has brought so many benefits to Peruvians.

A bureaucrat in a ministry cannot tell a fisherman or a ship owner what they should do with the product of their work. Do they have knowledge or right to do so? Why insist in using our anchoveta to produce lower value added goods than what the market requires through the relative price system? It is necessary to clarify the value added concept. The value added of an activity is the difference between the price of the manufactured product and the cost of inputs used in making it.[34] Forcing artisanal fishermen to deliver their catch to DHC plants reduces value added by their effort and consequently also their revenues. We wonder if this is rational and which may be the reasons for doing so.

Additionally, sustainability should be the fundamental criterion to manage renewable resources. To achieve this goal, we must put in place research, monitoring and policy decisions based upon recommendations from independent scientific entities sufficiently funded to do their job. In this regard, strengthening and development of IMARPE should be included as explicit objectives of the fisheries policy. IMARPE should also interact with domestic and foreign universities, and fisheries companies to build a world class applied sea research cluster in Peru. Peruvian fisheries will not be able to ensure their sustainability or find and develop new business niches if they do not get into abundant and serious applied scientific research. The State should promote and finance this activity as a public good.

Efficient and sustainable management of fisheries requires an eco-systemic approach. As the world moves in that direction, Peru still lacks systematized information or knowledge to provide specific and reliable guidelines and recommendations for fisheries' management. For now, it is necessary to generate more information and carry out studies to gradually adopt this approach when designing and managing our fisheries policy, supported by scientific research and cooperation between government, academia and business.

## 7.2 ACCESS

Since anchoveta is a single resource, rational and sustainable exploitation requires a single closed regime that takes into account this is a fully developed fishery. Artificial segmentations and juridical fictions have resulted in weak regimes and emergence of new with an adverse impact on resource sustainability as the number of economic players operating in this fishery grew unstoppably, not only for extraction but also for transformation, even illegally, of raw material. Besides the proliferation of regimes hampers the government's already limited ability to monitor and control.

The maximum catch cap system under Leg. Dec. 1084 has been one of the most significant reorganization measures of recent years. It promoted industrial fleet efficiency and ended the Olympic race. However, it did not include the artisanal fleet, split today between artisanal and smaller scale. This has weakened the system. Besides, the individual quota regime is seriously threatened by an ill-designed follow-up, control and surveillance system. Likewise, measures by the Executive Branch, the Judiciary or the Legislative Branch have included other economic agents in the fishing of anchoveta without taking into account that it is a fully exploited fishery. These economic players were added without the same requirements set for the industrial fleet. Therefore, it is indispensable to modernize follow-up, control and surveillance systems, ensure definitive closing of access to the fisheries, and establish global quotas and eventually individual ones for smaller scale and artisanal fleets.

S.D. 005-2012-PRODUCE and the related regulations created juridical fictions and adaptation regimes that only increased segmentation in anchoveta fisheries. Notwithstanding the implications of this regulation to the anchoveta fishery's efficiency, equity and transparency, it was enacted without previously ensuring the regulatory (quota) framework and the fleet could adapt to the new regulation, raising expectations among the new players that cannot be met with the current legal framework. Evident monitoring and control problems in residual fishmeal and waste reuse plants plague the system, as well as in the smaller scale fleet which keeps growing by the day. These problems will make the regulation more impractical and counterproductive in its current condition. The course needs quick correction to prevent more regulatory disorder and social chaos in this industry.

Government is clearly unable to monitor and control fleet growth, nor should it try to prevent economic players –artisanal, smaller scale and larger scale- from deciding what destination to give to their catches based upon market conditions and their own interest in an ideal future scenario and as it happens in other fisheries' access regimes around the world. Looking ahead, the fleet should not be segregated into IHC and DHC fleets, as this can only be a fiction. However, it will be necessary to adapt regulations and the industry's institutional set up before we can build a global quota and individual quotas regime applicable to the universe of the Peruvian anchoveta fishery.

## 7.3 FISHING FEES

Everybody should pay, with no exemptions granted. Generally, every economic agent profiting from and exploiting the nation's hydro biological resources should pay for the right to do so. Subsidies, if any, should not be linked to the extraction of this resource, but to the domestic selling of these resources for DHC in the local market.

The fees should be reviewed. Ship owners pay very low fees to the State for the exploitation of anchoveta when compared to other countries[35] and most of all when

compared to the revenues they earn from this resource through the quota regime or to the budgetary cost of efficiently managing Peru's fisheries. Other contributions by these economic players and which should be included as fishing duties are an absolute chaos. In most of the cases, they come from now unrelated or past laws. They should be conformed to the new laws and rules, to determine the right duties to be paid.

The duties should cover all administrative costs, and private players should not make any direct payments to inspectors. Fishing fees should be determined based upon technical and transparent criteria, paying attention at the incentives generated and, to the extent possible, using market information to guide their design.

## 7.4 JUVENILES

Offenses for fishing juveniles are not clearly defined or lack technical and practical foundations. Regulations assume that crews can identify the size and composition of fish schools before they catch them and determine if they have juveniles at proportions exceeding tolerance and that, therefore, they can prevent fishing specimens under the minimum allowed size, which is actually not possible.

Current regulations need reform because they encourage discarding smaller size fish caught at sea instead of reporting them at landings. Fishermen discard to avoid fines and confiscations that would reduce their earnings from their work and prematurely exhaust their individual fishing season's quotas. Timely reporting of juvenile catches should be promoted instead of fining vessels for bringing juveniles to land, provided they were not fished in a closed zone. There should even be agile mechanisms to close fishing zones as a precaution. On the contrary, ships return to closed zones where juveniles were detected. Stiff significant sanctions should be applied to deter these behaviors.

Current regulation transfers the duty to close zones to the regulated party when this role is inherent to the State. Besides, the State is seriously negligent when it comes to enforcing precautionary measures, such as closing a port even if there is no presence of juveniles, which reflects the inefficiency and ill design of its administrative systems. PRODUCE should perfect the mechanism to close zones if juveniles are present, taking into account their high impact on species sustainability. Existing information technologies can greatly help. IMARPE should have independence to directly enforce measures by decision of its senior management and thus incidentally reduce red tape.

The regulatory framework should also be adapted to small ship and artisanal fleets. This fleet, which fishes closer to the coast, may not need the same equipment as industrial ships. The option of granting them differentiated

treatment should be reviewed. However, reproduction and precautionary bans should embrace all extractive activities.

## 7.5 RESIDUAL AND SOLID WASTE REUSE PLANTS

Residual fishmeal and discard and waste reuse plants become a demand source so anchoveta aimed at DHC should not be illegally diverted to IHC or fishmeal. Monitoring and control is needed throughout the chain, from reception of raw material coming from permitted sources –DPA, docks, DHC plants- weighing, transformation, yield, packaging, commercialization to exports, if applicable.

Each of the industry's processes such as raw material rating, and the monitoring and control actions should be based on technical and scientific protocols and reports, like the conversion factor or efficiency standard, prepared by ITP and IMARPE.

If and when the fishing rights regime is reformed, collecting fees for artisanal and small scale fleet landings in plants receiving the resource should be streamlined to enhance operational efficiencies and the economic sense of controls.

## 7.6 FOLLOW-UP AND CONTROL SYSTEMS

It is essential to review SISESAT's policy for screening of inspectors by the regulated parties. Any technical improvement in the satellite follow-up system (i.e. in regards of two-way communications, transmission frequency, and command and control centers, among others) will fail if this structural organizational design problem is not addressed first. Incentives are perverse and ineffective.

Every economic actor engaged in extractive activities should have a satellite -or similar- follow-up system on board, not only for control but also for safety reasons. In the case of the smaller scale fleet, it should be a mandatory requirement for extractive activities. Such requirement should be a condition for formalization. For the artisanal fleet, it should be gradually enforced, perhaps port by port, given the large number of vessels. In any case, it is necessary this factor should be taken into account when designing the new SISESAT for the fisheries.

When building a reliable satellite follow-up system managed by the State even if outsourced to third parties, PRODUCE may propose the Legislative Branch to regard the system as sufficient evidence to sanction fishing in banned zones and for forceful inspection of a regulated party 's premises, This initiative could drastically reduce the courts' case load and make sanctions more effective.

The fishing and landing surveillance and control program could be improved by eliminating administrative sources of corruption. The program can be automated and improved using modern technologies, such as encryption, software, and electronic testimony, provided by world-class ITC suppliers.

Every plant in Peru that processes hydro biological resources should be monitored and controlled. No plants should work outside this program and the competent authority should proceed in line with existing criminal law. Enforcement of the rules, however, requires political will.

## 7.7 SANCTIONS

PRODUCE should restructure its administrative sanctioning procedure. Figures reveal its ineffectiveness and a number of perverse incentives. Many administrative sanctioning procedures are challenged in court. If not reformed, repeated challenges will result in nullity of the procedures.

Generally, the causes for sanctioning are not defined, and lack technical and juridical foundation. As a result, fines resulting from sanctioning procedures are almost impossible to collect from offenders.

There is no public registry of sanctions to inform potential buyers of fisheries rights of the latter's offenses and fines. Buyers and offenders should be forced by law to pay the fine, regardless of who owns the ship or the quota.

Do sanctions have teeth and are they dissuasive in the real world? The quick answer is no. Since fines are not generally paid, sanctions seem inoffensive and make the regime ineffective. In some cases, as with juveniles, the regime is counterproductive and promotes undesirable behaviors that need to be cancelled.

## 7.8 GOVERNANCE AND INSTITUTIONALITY

An independent Fishing Superintendent should perform separate monitoring and control functions –the most critical area at PRODUCE- separately from the regulatory, promotion and sector policy-making functions that can remain under a Fishing vice-Ministry.

The Decentralization Base Law must be urgently revised to set forth the Regional Governments' competences on fisheries, separately from PRODUCE roles. Serious regulatory gaps encourage informality and open access to legally closed regimes.

IMARPE should be an independent agency under the Cabinet Chief's Office to regulate on scientific issues. It could also decide biological or reproductive bans, thus creating a balanced power structure leading to fair and sustainable management.

Finally, the fishing industry could benefit from dialogue among stakeholders. Information and opinion experienced parties can help in efficiently regulating a heterogeneous, dynamic and changing industry. Publication of regulations for comment, policy debate among the main industry players –entrepreneurs, workers and fishermen in different subsectors, regulators, scientists and scholars- should not be an impediment for efficient regulation.

Sharing ideas regularly will allow authorities to make better decisions or change assumptions that do not reflect industry conditions. Prepublication and science based debate of options and policies will nurture the industry's regulatory process and contribute regulatory transparency and legitimacy, and contribute to long-term predictability and stability. The authors of this document hope this contribution helps in that process.

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1. In a strict juridical sense, due to regulatory hierarchy, Leg. Dec. No. 1084 did not have to be placed under the General Fishing Law's regulation. However, it would have been certainly desirable to have this regulation published and discussed transparently since it was the most important reform concerning access to anchoveta fishery in the last 40 years. Contrary to what happened with Leg. Dec. No. 1084 itself, the regulations under it, both for the center north and southern zones, were published for comment by the main industry stakeholders.
2. However, there were numerous complaints among ship owners whose vessels were involved in bidding or judicial processes in breach of established procedures. Many of these challenges were effective, but allowed putting fishing permits through a regular judicial process. The result is a weaker system because the fleet increased due to illicit interference by unscrupulous judges.
3. Under the former global quota regime with no allocation of individual quotas, the incentives structure led to the Olympic race and fleet over sizing. The new regime changed incentives and reduced fleet size but created an incentive to under-report the effectively landed catch.
4. Ministry of Production of Peru (2009).
5. In fact, to reach a 4.2 or 4.1 average ratio for the industry, many plants should have scored less than 4.2 or 4.1 during the fishing season, which is not possible.
6. Chávez and Salgado (2005) show how the individual quota system can lead to suboptimal results when institutions are weak, and fisheries regulations are ignored, i.e. when there is illegal fishing. Further studies (Chávez, Nuria & Salgado,2008; Chávez & Salgado,2010)- confirmed the practical relevance of this for various fisheries in Chile. Salgado (2013) analyzes the relevance of the Chilean experience with individual quotas for the Peruvian case.
7. In effect since 1992, with S.D. No. 017-92
8. This is not totally true, because DHC plants have been allowed to aim up to 40% of artisanal and smaller scale fleet landings to IHC since November 2011 through S.D. No. 017-2011, by declaring those landings as inappropriate for their processes.
9. Besides, fishing ship owners and industrial fisheries facilities had to sign true and full compliance agreements with the General Follow-up Control and Surveillance Directorate before they could start fishing. The signing fee is 28% of UIT. The fee is distributed among Regional Governments to help strengthen surveillance and control actions. Offenders are subject to suspension or termination of the agreement.
10. The annual budget for the Fisheries vice-Ministry was US$ 18 million from 2009 to2012, while IMARPE's was US$ 3 million.
11. The same happens when they omit to inform about the zones where these specimens are located or with the obligation to stop sampling when higher than tolerated rates of small juveniles are found, among other binding cases that are also sanctioned.
12. The relevant regulations are: (i) Articles 145º and 146º of the Regulation on

the General Fishing Law (RLGP) – approved by S.D. No. 012-2001-PE and its amendments; (ii) Codes Nº 6 and 123 of the Annex to the Single Uniformed Text of the Fisheries and Aquiculture Inspections and Sanctions Regulation (TUO RISPAC), approved by S.D. No. 019-2011-

13. PRODUCE; and (iii) article 6º of S.D. No. 008-2012-PRODUCE that stipulates conservation measures for the hydro biological resource.
14. In theory a skilled person following a protocol may safely enter a ship's vessel hold to take technical samples but this is not always feasible or practical. Therefore immediate reporting of catches should be encouraged.
15. A survey by Ipsos Peru, discussed at the 2012 CADE Executive Meeting, revealed the fishing industry was perceived by entrepreneurs as the second most corrupt (after the construction industry).
16. The obligation of not exceeding maximum juvenile catch percentages is included in the 1992 General Fishing Law as follows: "Those responsible for extracting and/or processing specimens in smaller sizes or in a larger percentage than established (...) will be sanctioned with the suspension of concessions, authorizations, permits or licenses for one hundred and eighty (180) calendar days, notwithstanding other possible sanctions". This offense has been systematically included following issuance of the first regulation on the General Fishing Law, approved by Supreme Decree No. 001-94-PE.
17. For example, Salvattecci & Mendo (2005) review the economic losses resulting from catching juveniles in 2002 when 1,935 tons of anchoveta juveniles were landed. If this had not happened, the biomass would have grown by 255,993 tons, particularly in Chimbote, and larger volumes of fishmeal and fish oil would have created additional revenues exceeding US$ 90 million.
18. The information concerning sanction records in PRODUCE's official portal is not necessarily representative. In fact, it is very likely that sanctions for this infraction are not many, compared to the volume of juveniles discarded at sea or are not registered at the landing point due to corruption in the surveillance and control program.
19. IMARPE mentions that "information on landings at port do not entirely reveal the high incidence of juveniles found in the Peruvian coastal sea, because the fleet is discarding juveniles in fishing areas to prevent fines". (IMARPE, 2012, p.5)
20. At this rate, in a normal fishing year, the annual discarded volume can fluctuate between 100 and 150 thousand tons.
21. Since IMARPE's Onboard Observer Program will continue, now ship owners are obliged to take two inspectors, taking out two crew members, or 20% of the labour force in artisanal ships. This increases the effort per worker and/or fixed costs.
22. At the end of 2011 there were 16 solid waste reuse plants and 29 residual fishmeal plants.
23. In fact, there is another fishmeal production segment which is totally outside the law: fishmeal produced by drying in the open air. This reveals the substantial returns that can be earned from fishmeal and the government's weak monitoring and control capacities.

24. Article 6 of S.D. No. 002-2010-PRODUCE, amended by S.D. No. 008-2010-PRODUCE and S.D. No. 005-2012-PRODUCE.
25. M.R. No. 031-2007-PRODUCE approved three qualified companies as appropriate to provide the Satellite Follow-up System –SISESAT, to larger fishing vessels for three years. These were: COLLECTE LOCALIZATION SATELLITES PERU S.A.C. – CLS PERÚ S.A.C., GEO SUPPLY PERÚ S.A.C. and MEGATRACK S.A.C.
26. According to De La Puente et al. (2011) this control does not occur in practice because, as PRODUCE states, they do not have enough personnel to process satellite information and update the corresponding list on a daily basis.
27. For a number of recommendations and the proposal of the new SISESAT regulation submitted by PRODUCE, see Miranda (2013) and the MINAM Workshop, as well as the GEF-UNDP-Humboldt Project (2013) on satellite-based ship monitoring systems.
28. There is evidence that the weighing system and the reports by supervising companies were tampered with during the first two years of the individual quota regime (2009-2010). However, the system presumably has improved, despite consensus about significant pending improvements, including information encryption, outsourcing transmission and data processing to specialized companies, installing sampling equipment in processing plants, among others.
29. Data provided by the Ministry of Production, according to Law Nº 27806 "Transparency and Access to Public Information Law".
30. Apparently the increase of reported offenses for fishing of juveniles after 2009 contradicts the hypothesis in section II and does not reflect the strong reduction in offenses between 2008 and 2009. Therefore, more research is needed on the reasons behind this behavior, including analyses of offense distributions during the fishing season before and after the individual quota regime.
31. Available at: http://www.produce.gob.pe/index.php/prensa/noticias-delsector/1569-produce-retoma-la-funcion-fiscalizadora-y-de-control-de-la-pescade-menor-escala-e-industrial-con-el-decreto-supremo-005
32. According to this source, 36% of those sanctions were suspended after they were challenged.
33. Sánchez, G (2010). "The environmental responsibility principle and its application by public administration within the framework of sanctioning administrative procedures: a critical perspective". Thémis – Época 2, No. 58.
34. See, for example, Paredes and Gutiérrez (2008).
35. At aggregate level (leaving aside some small accounting adjustments), the value added of all sectors equals GDP and is the national income. Requiring using anchoveta in an activity markets undervalue, such as aiming it to a DHC and not an IHC plant, reduces the fishermen's product and revenues. It also reduces state revenues and, therefore, the possibility of financing social nutrition programs, such those at MIDIS. Why should this be desirable?
36. See Paredes (2012).

# ACRONYMS (SPANISH - ENGLISH)

| | |
|---|---|
| CBSSP | Fishermen Benefits and Social Security Bank<br>Caja de Beneficios y Seguridad Social del Pescador |
| CHI/IHC | Indirect Human Consumption<br>Consumo Humano Indirecto |
| CHD/DHC | Direct Human Consumption<br>Consumo Humano Directo |
| DICAPI | General Captainship and Coastguard Directorate of Peru<br>Dirección General de Capitanías y Guardacostas del Perú |
| DIGSECOVI | General Follow-Up, Control and Surveillance Directorate<br>Dirección General de Seguimiento, Control y Vigilancia |
| DPA | Artisanal Fishing Docks<br>Desembarcaderos Pesqueros Artesanales |
| D.S./S.D. | Decreto Supremo<br>Supreme Decree |
| FONCOPES | Compensation Fund for Fisheries Ordering<br>Fondo de Compensación para el Ordenamiento Pesquero |
| IMARPE | Institute of the Sea of Peru<br>Instituto del Mar del Perú |
| INEI | National Statistics and Information Institute<br>Instituto Nacional de Estadística e Informática |
| ITP | Fisheries Technological Institute<br>Instituto Tecnológico Pesquero |
| LMCE | Maximum Catch Limits per Vessel<br>Límites Máximos de Captura por Embarcación |
| MINAM | Ministry of the Environment<br>Ministerio del Ambiente |
| OSPAs | Social Artisanal Fishermen Organizations<br>Organizaciones Sociales de Pescadores Artesanales |
| PAS | Sanctioning Administrative Procedures<br>Procedimientos Administrativos Sancionadores |
| PCM | Presidency of the Council of Ministers<br>Presidencia del Consejo de Ministros |
| PMCE | Maximum Catch Percentage per Vessel<br>Porcentaje Máximo de Captura por Embarcación |
| PRODUCE | Ministry of Production<br>Ministerio de la Producción |

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| PROSUR | Fund for the Promotion of Artisanal Fishing<br>Fondo para la Promoción de la Pesca Artesanal |
| PVCDPAM | Sea Fishing and Landing Surveillance and Control Program<br>Programa de Vigilancia y Control de la Pesca y Desembarque en el Ámbito Marítimo |
| RH/HR | Hydro biological Resources<br>Recursos Hidrobiológicos |
| RISPAC | Fisheries and Aquiculture Inspections and Sanctions Regulation<br>Reglamento de Inspecciones y Sanciones Pesqueras y Acuícolas |
| R.M./M.R. | Ministry Resolution<br>Resolución Ministerial |
| ROP | Fisheries Reorganization Regulation<br>Reglamento de Ordenamiento Pesquero |
| SISESAT | Satellite Tracking System<br>Sistema de Seguimiento Satelital |
| SNP | National Fisheries Society<br>Sociedad Nacional de Pesquería |
| TICs/ICTs | Information and Communication Technologies<br>Tecnologías de Información y Comunicación |
| TM | Metric Ton<br>Tonelada Métrica |
| t/h | Tons per Hour<br>Tonelada por hora |
| TUO - RISPAC | Single Conformed Text of the Fisheries and Aquaculture Inspections and Sanctions Regulations<br>Texto Único Ordenado del Reglamento de Inspecciones y Sanciones Pesqueras y Acuícolas |
| TUPA | Conformed Text of Administrative Procedures<br>Texto Único de Procedimientos Administrativos |

# LIST OF REGULATIONS

## ACCESS TO FISHERIES AND FISHING RIGHTS

| Date | Description |
|---|---|
| 1992 | LEGISLATIVE DECREE No. 25977<br>The 1992 General Fishing Law and its Regulation (Supreme Decree No. 01-94-PE, replaced by Supreme Decree No. 012-2001-PE) establishes the basic operation rules in the fisheries sector, granting the Ministry of Fisheries, now Ministry of Production (PRODUCE) the power of establishing Fisheries Reorganization Plans, which are regulations to manage specific fisheries and promote greater economic benefit and fisheries' sustainability. The regulations include, among others, global catch quotas, catch seasons (fishing holidays), protection of juvenile specimens, establishment of banned or reserved zones, as well as extraction methods. According to the General Law, the Ministry of Production has the power to suspend granting of new fleet increase authorizations and new catch permits for species that are fully exploited, as well as to provide for measures aiming at reducing the fisheries effort. |
| 1994 | S.D. No. 01-94-PE<br>Enacts the Regulations on the General Fishing Law. Environmental Adaptation and Management Programs (PAMAs) as well as the Environmental Impact Assessments (EIAs) for the fisheries sector. PAMAs include methods, measures, procedures, actions and investments to assess, reduce, control and remediate environmental impacts created by an existing fishery. EIAs are required before starting any fishing activity. Both instruments regulate, treatment and/or recovery of organic matter contained in effluents tail water, serous blood and equipment flushing, and others. |
| 1997 | S.D. No. 001-97-PE<br>Enacts the lists of fishing vessels after the census carried out by the National Statistics and Information Institute and inspections through SGS. They are divided in vessels with administrative rights and illegal and undocumented vessels.<br><br>R.M. No. 781-97-PE<br>Anchoveta *(Engraulis ringens)* and sardine *(Sardinops sagax)* declared as fully exploited hydro biological resources. Implements the Larger Scale Purse Seiner Fishing Fleet Streamlining Program to regulate the fishing effort, and preserve and develop hydro biological resources |

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| 1998 | LAW D No. 26920<br>Exempts ship owners of wood vessels of up to 110 m3 hold capacity from the requirement of fleet increase referred under article 24 of the General Fishing Law. |
| 2001 | S.D.. No. 012-2001-PE<br>Ministry of Production determines geographic zones subjected to bans or limitations for fishing processing, according to the availability of hydro biological resource, production capacity of existing industries and environmental protection requirements. |
| 2004 | LAW No. 28193<br>This law extends the special multi-sector committee's deadline for restructuring the Fishermen's Benefits and Social Security Bank. |
| 2004 | LAW No. 28320<br>This law extends the deadline mentioned in subsection A article 3º in Law No. 28193 and the special multi sector committee term for restructuring the Fishermen Benefit and Social Security Bank. |
| 2006 | S.D. No. 020-2006-PRODUCE<br>This law establishes the two years (02) suspension counted as from the date following its publication, for construction of artisanal fishing vessels larger than 12 meters long, 4 meters beam, and 1.8 meter deep, and/or larger than 10 cubic meters hold capacity. |
| 2006 | S.D. No. 024-2006-PRODUCE<br>This decree amends article 45 in the Regulation on the General Fishing Law and facilitates financing of scientific research projects, technological development and other related to fisheries and aquaculture. |
| 2008 | D.S. No. 003-2008-PRODUCE<br>Procedure for Regional Governments of Arequipa, Moquegua, and Tacna to formalize, as appropriate, the Special Anchoveta Fishing Regime in the southernmost part of the country. This is the special industrial fishing regime within five maritime miles offshore in south Peru. |

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| 2008 | LEGISLATIVE DECREE No. 1084<br>Law on Maximum Catch Limits per Vessel. Establishes the individual quota mechanism for anchoveta and white anchoveta (engraulis ringens and anchoa nasus) aimed at Indirect Human Consumption with the purpose of improving conditions for its modernization and efficiency, promoting sustained development as food source, employments and revenues, and ensuring responsible use of hydro biological resources in harmony with environmental preservation and biodiversity conservation. |
| 2009 | S.D. No. 009-2009-PRODUCE<br>Regulatory provisions for the Maximum Catch Limits per Vessel System in south Peru, with consideration for the technical, juridical and social conditions of extractive activities in that zone, and Legislative Decree No. 1084, which establishes differentiated allocation procedures for individual rights, correspondingly, in the North Center Zone, for vessels under the General Fishing Law or special Law No. 26920. |
| 2009 | M.R. No. 100-2009-PRODUCE<br>Reorganization measures for anchoveta extraction by artisanal fishing vessels including the Registry of Artisanal Vessels for anchoveta carried by Regional Governments. |
| 2010 | S.D. No. 010-2010-PRODUCE<br>Regulation on Anchoveta *(Engraulis ringens)* and White Anchoveta *(Anchoveta nasus)* Fishing Reorganization for Direct Human Consumption. |
| 2010 | M.R. No. 168-2010-PRODUCE<br>Regional Production Directorates of Regional Governments with jurisdiction on the coast will verify compliance with technical requirements set forth in the Regulation of Anchoveta and White Anchoveta Fisheries Reorganization for Direct Human Consumption regarding artisanal fishing vessels. |
| 2012 | S.D. No. 005-2012-PRODUCE<br>Amendment to the Regulation on Anchoveta and White Anchoveta Fisheries Reorganization, establishing reserve zones for direct human consumption and exceptional regimes. |

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| 2013 | LAW No. 30003<br>To facilitate access of fisheries' workers and retirees to social security and introduces extraordinary measures for fisheries' workers and retirees comprised in Resolution SBS 14707-2010 that closes and liquidates the Fishermen's Benefits and Social Security Bank. |

| JUVENILES FISHING AND DISCARDING | |
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| **Date** | **Description** |
| 2011 | S.D. No. 019-2011-PRODUCE<br>Approved the Single Conformed Text of the Regulation on Fisheries and Aquiculture Inspections and Sanctions – RISPAC. |
| 2012 | M.R. No. 457-2012<br>Authorizes the start of the Second Fishing Season of anchoveta *(Engraulis ringens)* and white anchoveta *(Anchoa nasus)* in the southern zone, from November 2012 to January 2013. |
| 2012 | S.D. No. 008-2012-PRODUCE<br>To ensure protection of anchoveta among which the obligation of reporting the fishing zone where juveniles are found and of not returning to said zones under impending administrative sanction. |

| RESIDUAL FISHMEAL AND DISCARDS AND HYDRO BIOLOGICAL SOLID WASTE AND DISCARDS REUSE FACILITIES | |
|---|---|
| **Date** | **Description** |
| 2001 | M.R. No. 218-2001-PE<br>Provisions applicable to fishmeal processing. |
| 2005 | M.R. No. 043-2005-PRODUCE<br>Provisions for processing of fish, seafood and hydro biological resource waste and residues generated in artisanal fishing docks. |
| 2006 | M.R. No. 205-2006-PRODUCE<br>Regulates the processing of hydro biological species waste and discards from industrial processing of fisheries for direct human consumption. |

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| 2008 | M.R. No. 431-2008-PRODUCE<br>Amends the chart in M.R. No. 205-2006 and 197-2007-PRODUCE establishing the total installed capacity limits for Sullana province. |
| 2010 | M.R. No. 201-2010-PRODUCE<br>It establishes a yield standard for the grated anchoveta conserve product proportional to the higher yield rate of the ½ pound tuna conserve established by the Fisheries Technological Institute of Peru. |
| 2011 | S.D. No. 005-2011-PRODUCE<br>Enacts the Regulations on processing hydro biological resource discards and/or waste. Comprised of 18 articles and 5 supplementary transitory provisions, and the corresponding Glossary of Terms. |
| 2011 | S.D. No. 017-2011-PRODUCE<br>Amends the regulation on processing hydro biological resource discards and waste approved by Supreme Decree No. 005-2011-PRODUCE. |
| 2012 | S.D. No. 008-2012-PRODUCE<br>Measures for the conservation of hydro biological resources. |

**CONTROL AND SURVEILLANCE SYSTEMS**

| Date | Description |
|---|---|
| 2003 | S.D. No. 026-2003-PRODUCE<br>Regulations for the Satellite Tracking System – SISESAT. |
| 2003 | S.D. No. 027-2003-PRODUCE<br>It creates the Sea Fishing and Landing Surveillance and Control Program. |
| 2004 | S.D. No. 018-2004-PRODUCE<br>Creates the Satellite Tracking System to control the industrial fisheries fleet. Open to different technological options available in the market that will operate and function simultaneously under Ministry of Production supervision. |
| 2010 | S.D. No. 002-2010-PRODUCE<br>It expands the scope of the Sea Fishing and Landing Surveillance and Control Program to industrial fisheries facilities authorized to manufacture residual fishmeal, to solid waste service supply companies (EPS-RS) and to direct human consumption facilities using their fishmeal plants to process waste and discards. |

| SANCTIONS | |
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| **Date** | **Description** |
| 2001 | S.D. No. 012-2001-PE<br>Regulations under the General Fishing Law. It establishes that the Ministry determines the geographic zones subjected to prohibitions or limitations to carry out fish processing activities, according to hydro biological resource availability, existing industry production capacity, and environmental protection standards. |
| 2007 | S.D. No. 015-2007-PRODUCE<br>Amendments to the Regulation under the General Fishing Law, approved by Supreme Decree No. 012-2001-PE. |
| 2007 | S.D. No. 016-2007-PRODUCE<br>Enacts the "Regulation on Fisheries and Aquaculture and Inspections and Sanctions" (RISPAC). |
| 2009 | S.D. No. 013-2009-PRODUCE<br>Amends and adds subsections to article 134º of the Regulation on the General Fishing Law enacted by Supreme Decree No. 012-2001-PE and No. 010-2008-PRODUCE. |

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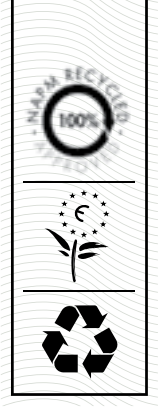

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