

An Estimation of Compliance of the Fisheries of Peru with Article 7 (Fisheries Management) of the UN Code of Conduct for Responsible Fishing

by

Daniela Kalikoski, Marcelo Vasconcellos and Tony J Pitcher

This evaluation of compliance with Article 7 (Fishery Management) of the UN Code of Conduct for Responsible Fishing (FAO 1995) is a 'living document' and may change with time. It is one of 53 such country evaluations covering the top 96% of the world fish catch. Using a wide range of cited source material, the document represents the best attempt by the authors at presenting a fair and objective evaluation of compliance using 44 questions derived from the Code. Questions are divided into six evaluation fields, (Management Objectives; Framework (data & procedures); Precautionary Approach; Stocks, Fleets and Gear; Social and Economic factors, and Monitoring, Control and Surveillance): the derivation of the 44 questions is described in Pitcher (1999). The first three fields cover intentions of a country's legislation to adhere to the Code; while the last three evaluation fields are intended to rate actual performance. Full details of the methods are published in Pitcher, Kalikoski and Pramod (2006). This evaluation has been subjected to several internal cross-checks and, where stated, has been validated by experts familiar with the country concerned. Uncertainty in assigning each score is shown explicitly. However, the authors are aware that omissions and errors of interpretation may still remain for some countries. An open protocol has therefore been adopted for all country compliance evaluations, and the team remains open at any time to comments, corrections or adjustments. Updated versions are made available online as necessary (<ftp://ftp.fisheries.ubc.ca/CodeConduct>).

FAO (1995) Code of Conduct for Responsible Fisheries. FAO, Rome, 41pp.

Pitcher, T.J. (1999) Rapfish, A Rapid Appraisal Technique For Fisheries, And Its Application To The Code Of Conduct For Responsible Fisheries. FAO Fisheries Circular No. 947: 47pp.

Pitcher, T.J., Kalikoski, D. and Pramod, G. (eds) (2006) Evaluations of Compliance with the UN Code of Conduct for Responsible Fisheries. Fisheries Centre Research Reports 14(2).

Copy edited by Janice Doyle

General

Ranked 2nd in world catch 1999	8,390,557	tonnes (FAO)	
In own EEZ	7,660,494	91.3% (SAU)	796,503 km ² = 9.6 t/km ²
In others' EEZs	0	0% (SAU)	
On High Seas	707,044	8.4% (SAU)	

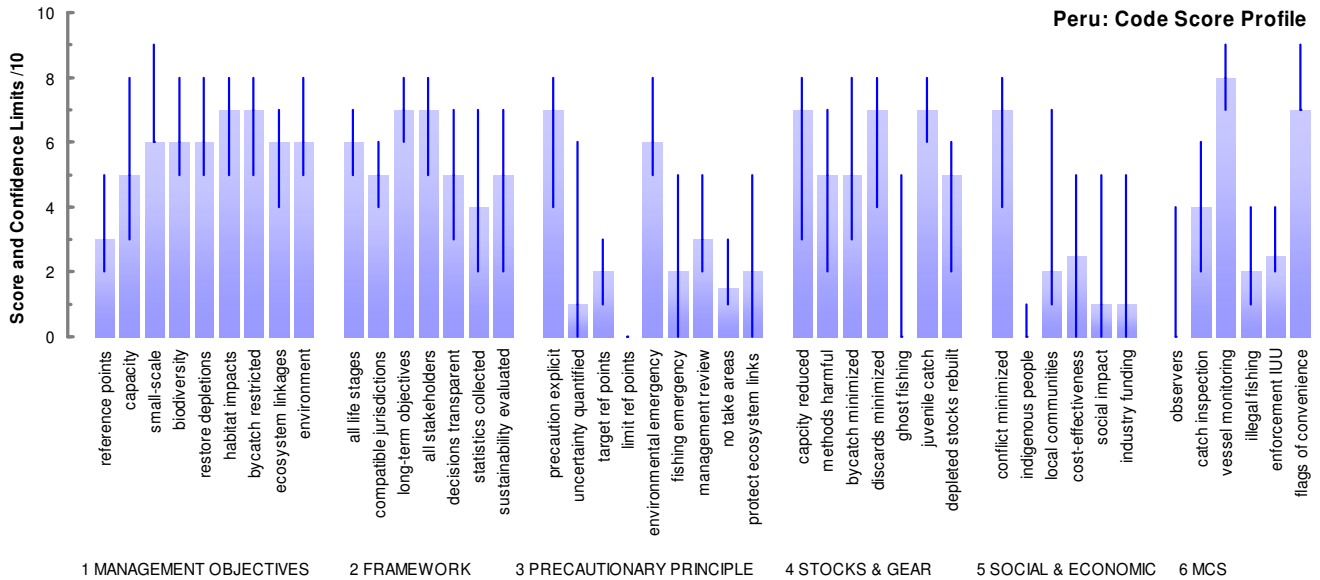
Other countries' estimated catch in Peruvian EEZ
224 tonnes, 0% of domestic catch (SAU) (Japan)

Scored 4/10 (range 3.2– 5.0), ranked 445/145 in the 2004 corruption perception index (Transparency International 2004)

Fishery management quality index is 3/6 (McWhinnie 2004).

International Treaties score = 50% of maximum possible (from SAU data)

Kelleher (2004) reports discards as high as 80% for Peru.



Note: Scores for Q6.4 and Q6.6 have been flipped in the above figure to show fisheries compliance

Field 1: Management Objectives

1. Are formal reference points for the fish stock in this fishery identified using best science available?

Score: 3

Score Range: 2 - 5

According to the Peruvian report to FAO (2003) there are no specific reference points for exploited populations. The available information on the status of the main resources indicates that the stock of anchoveta is over-fished but in the process of recovering, the stock of sardine is fully to over-fished, hake is considered over-fished to depleted, the jumbo flying squid is considered moderately exploited and the Chilean jack mackerel is considered fully to over-fished (Csirke, in press). Despite the lack of reference points there are systems of quotas in place for the important resources, such as anchoveta and the calamar gigante (e.g., RESOLUCION MINISTERIAL N° 208-2002 sets the quota for the calamar gigante, *Dosidicus gigas*, at 150,000 tonnes for 2003).

2. Is present fleet capacity calculated?

Score: 5

Score Range: 3 - 8

According to the Peruvian report to FAO (2003), fisheries management plans contain measures to ensure that the level of fishing is commensurate with the state of fisheries resources. According to the same report the evaluation of fishing capacity has been initiated. Work is being done at the institutional level on fishing capacity and is used to regulate fishing effort, especially of the resources that are fully exploited (FAO, 2003). For instance, Article 12 of the Fisheries Code (Ley General de Pesca), approved by Decree N° 012-2001-PE, established that the Fisheries Ministry will not authorize increases in the fleet nor access licenses to fisheries based on resources considered fully exploited, with the exception of cases of substitution of vessels of the same tonnage capacity. With the objective to

define the current fishing capacity, the Fisheries Ministry has also conducted a census of the fishing vessels and the verification of the tonnage of all vessels with tonnage larger than 32.6 m³.

3. Are small scale fishers considered in plan?

Score: 6

Score Range: 6 - 9

According to the Peruvian report to FAO (2003) fisheries management plans provide for stakeholder participation in determining management decisions and also address the interests of small-scale fishers. The legislation has defined the zone within 5 nautical miles from the coast reserved for artisanal and small-scale fishers and where gears that can alter [impact] marine environmental conditions are forbidden. The National Fisheries Code (Ley General de Pesca 25977 of 1992) devotes different articles to artisanal fisheries. They involve measures to foster the development and technological capacity of small-scale fisheries (Artículo 32), defining areas of access restricted to artisanal fishers (Article 33) and establishing a special regime of promotion in favor of the artisanal fisheries sector (Artículo 36).

4. Impacts of fishery on biodiversity allowed for in plan?

Score: 6

Score Range: 5 - 8

According to the country report to FAO (2003), individual fisheries management plans address the biodiversity of aquatic habitats and ecosystems, including the identification of essential fish habitats. The same report states that the status of the shark populations (as requested by the IPOA on sharks) has not been evaluated. On the other hand, the impact of fisheries on seabird populations has been evaluated and, given the small size of the longline fishing fleet, it has been determined that there is no incidental catch of seabirds.

5. Does the management plan aim to restore depleted stocks in this fishery?

Score: 6

Score Range: 5 - 8

According to the country report to FAO (2003), individual management plans contain measures to allow depleted stocks to recover.

6. Are human impacts (pollution, waste) on the fishery habitat identified?

Score: 7

Score Range: 5 - 8

The Peruvian Fisheries Code (Ley General de Pesca, no. 25877 of 1992) makes specific reference to the prohibition of activities that can impact coastal and marine habitats, including the destruction of mangrove areas and estuaries and disposal of toxic substances and materials that can put at risk the health of coastal populations and ecosystems.

7. Is fishing gear mandated by the management plan to avoid by-catch of non-target species, environmental and habitat damage?

Score: 7

Score Range: 5 - 8

According to the country report to FAO (2003), individual fisheries management plans address the protection of endangered species in different ways. To limit incidental catch and discards, the maximum percentages of individuals below minimum size and non-targeted species in the catch was established. The National Fisheries Code (Ley General de Pesca, no. 25977 of 1992) forbids the exploitation of aquatic resources with the use of explosives, toxic substances and other elements that could put at risk human life and the aquatic resources.

8. Are ecosystem linkages with this fishery made explicit in the management plan?

Score: 6

Score Range: 4 - 7

One of the most important ecosystem linkages with the pelagic fisheries is with guano-producing seabirds. IMARPE maintains a research program on the interactions between fisheries and seabirds and marine mammals (www.imarpe.gob.pe).

9. Are environmental influences on this fishery made explicit in the management plan?

Score: 6

Score Range: 5 - 8

El Niño events have a substantial influence in all Peruvian fisheries. To account for the environmental influences, the marine environment is routinely monitored (FAO, 2003) and emergency plans elaborated during extreme events (see section on El Niño).

Field 2: Framework (data & procedures)

1. Are total and complete removals from this stock over the whole stock area and over whole life cycle accounted for in assessment?

Score: 6

Score Range: 5 - 7

Although there is limited data for some resources, in general adequate catch and effort statistics are available for management (FAO, 2003). There is no specific information on the quality of the system of collection of fisheries statistics. The problem of poor species identification is not as critical considering that a few species account for a substantial proportion of total catches. About 5% of the total catch volume is not identified to the species level (Vasconcellos and Cochrane, in press).

2. Are management measures compatible with those of other jurisdictions concerned with this stock?

Score: 5

Score Range: 4 - 6

Peru, Chile, Ecuador and Colombia signed the Galapagos Agreement in August of 2000 establishing the general framework for the creation of a Regional Fisheries Body (Comision Permanente del Pacífico Sur) that will be responsible for regulating the use of straddling and highly-migratory stocks exploited by the four countries and other States in the Southeast Pacific. The Galapagos Agreement mirrors many of the principles established in the UN Fish Stocks Agreement, including the application of precautionary approach and inclusion of ecosystem considerations, besides listing types of measures

for regulating, controlling and surveillance of fisheries in the area. In mid-2006, the agreement was in not yet in force.

Peru and Chile are in the process of implementing a project on the Integrated Management of the Humboldt Current Large Marine Ecosystem. The general objective of this GEF-funded project [Integrated Management of the Humboldt Current Large Marine Ecosystem](#) (IMHCLME) is to enhance the national and regional efforts to move forward towards an integrated and sustainable management of this LME. The first phase of the project started in July 2002, and the primary tasks during the first year were to be to define the key problems, issues and threats and to identify priorities, options and alternatives; to make a Transboundary Diagnostic Analysis and Strategic Action Program for the IMHCLME; to outline a series of activities and projects funded by national governments and donor agencies, together with a financing plan; and to make detailed proposals for GEF financing (<http://www.imarpe.gob.pe/imarpe/proyecto.php>).

3. Does the management plan have clearly stated long-term objectives?

Score: 7

Score Range: 6 - 8

According to Article 1 of the Peruvian Fisheries Code (Ley General de Pesca, 25977 of 1992) the general goal of fisheries management is to promote sustainable development of fisheries as a source of food, labor and rent?, and to secure the responsible use of resources so as to optimize the economic benefits in harmony with the preservation of the environment and the conservation of biodiversity.

4. Are all the stakeholders in this fishery resource identified and considered?

Score: 7

Score Range: 5 - 8

There is no specific information on the decision-making approaches adopted by the government. According to the information reported by the Peruvian government (FAO, 2003), individual fisheries management plans provide for stakeholder participation in determining management decisions. Article 5 of the Organic Law for the Sustainable Use of Natural Resources (Ley Organica para el Aprovechamiento Sostenible de los Recursos Naturales, Ley 26821/1997) guarantees to all citizens the right to participate in the definition and adoption of public policies regarding the use and conservations of natural resources.

5. Is data management process and decision-making open and transparent, including any international aspects?

Score: 5

Score Range: 3 - 7

No specific information.

6. Are timely, complete and reliable statistics collected and verified?

Score: 4

Score Range: 2 - 7

Although there is limited data for some resources, in general adequate catch and effort statistics are available for management (FAO, 2003). There is no specific information on the quality of the system of collection of fisheries statistics.

7. Are social, economic and institutional factors related to sustainability evaluated with data?

Score: 5

Score Range: 2 - 7

Article 9 of the Peruvian Fisheries Code (Law N° 25977) establishes as a function of the Fisheries Ministry to determine, based on available scientific evidence and socioeconomic factors, and according to fisheries type, the management systems, the allowable catch quotas, the fishing seasons and areas, the regulation of fishing effort and the types of fishing methods as well as other norms necessary for the preservation and rational use of aquatic resources.

Field 3: Precautionary Approach

1. Is precaution explicitly enshrined in legislation, and is applied to management of this fishery stock?

Score: 7

Score Range: 4 - 8

The report of the Peruvian government to FAO (2003) recognizes two ways in which the precautionary approach is applied in fisheries management. For developing fisheries, the necessary measures are taken to control the growth of fishing effort beyond the capacity of stocks, whereas for stocks considered fully exploited only the substitution of effort is allowed to avoid the building of excess fishing capacity. On the other hand, Zapata and Broad (2003) mention as an example of a lack of precaution in management decisions, the scheme of privatization of the Peruvian fishing industry, which relied heavily on borrowing money from banks without calculating the risks of bad years ahead. "Technically the whole industry is in bankruptcy and some analysts maintain that El Niño has caused their financial situation. Another point of view, however, is that El Niño has merely revealed the fragility of a privatization process that favored Peruvian industrialists who had leaned heavily on Peruvian private banks. The debt was based on an excessively risky calculation that only contemplated a continuum of good years and made no provisions for safeguarding against the lamentably confirmed possibility of three bad years in a row" (Zapata and Broad, 2003).

2. Is uncertainty, including lack of appropriate information, quantified and used to restrain fishing that might otherwise occur?

Score: 1

Score Range: 0 - 6

Does not appear to be used explicitly.

3. Are stock-specific target reference points estimated and employed?

Score: 2

Score Range: 1 - 3

There are said to be no specific reference points for individual stocks (FAO 2003), although anchoveta and hake assessment and management uses reference points implicitly because quotas are set.

4. Are stock-specific limit reference points estimated and employed?

Score: 0

Score Range: 0 - 0

There do not appear to be any limit reference points.

5. Are there viable contingency plans to restrict fishing in the event of an environmental emergency?

Score: 6

Score Range: 5 - 8

The El Niño of 1997 was the first time the government prepared for the event beforehand (Zapata and Broad, 2003). The plan, designed mostly for dealing with flooding events, had many reasons to be considered a failure (including corruption, centralization of management power, inter-institutional articulation, etc.). But there is some positive indication that effective measures were taken to prevent extreme effects on fisheries. "IMARPE managed the 1997-98 El Niño in a more prudent manner than it had done in earlier events. It did not allow over-fishing in 1997, before the warmer temperatures had set in. The marine biota withstood the trauma with enough vitality left over to bounce back after only two bad years. Biological normality returned to the seas by the third year. Actually, the two bad years were not really terrible because the catch still amounted to half of pre-El Niño levels. Its management of the marine biota during this El Niño has enhanced IMARPE's reputation." (Zapata and Broad 2003).

6. Are there viable contingency plans to restrict fishing in the event of an unforeseen emergency caused by excess fishing?

Score: 2

Score Range: 0 - 5

During El Niño emergencies, Peru has not had a great record of being able to reduce fishing pressure when it was required, although this may have improved during the 1990s.

7. Are management instruments under continuous review?

Score: 3

Score Range: 2 - 5

Reviews of management do take place from time to time.

8. Are no-take areas of sufficient size to work, established, policed and monitored as an insurance?

Score: 1.5 No-take areas less than 1% of EEZ (1).

Score Range: 1 - 3

Five protected areas listed for Peru in the UNEP-WCMC (2002) database sum to an area of about 2,751 km² (SAU, 2005), equivalent to 0.34% of the EEZ; most of this is in one large wetland MPA (Paracas). It is likely that none of them can be considered no-take because they are assigned IUCN codes III and VI (less restrictive types of protected areas).

9. Are plans in place to restrict fishing if species linked through the ecosystem to the target(s) of this fishery become threatened?

Score: 2

Score Range: 0 - 5

IMARPE maintains a research program on the interactions between fisheries and seabirds and marine mammals (www.imarpe.gob.pe), but there do not appear to be any specific management plans linked to threats to the guano-producing birds.

Field 4: Stocks, fleets and gear

1. Is excess fleet capacity being reduced?

Score: 7

Score Range: 3 - 8

Management plans address fishing capacity including the economic conditions under which the fishing industry operates (FAO, 2003). In fisheries identified with excess fishing capacity measures have been adopted to close access, allowing only the substitution of vessels. Parallel to this, measures were also adopted to forbid the increase in processing capacity of fishmeal plants. To avoid the excess fishing capacity of some fisheries, the construction of vessels and the installation of new processing plants is not allowed without a permit from a competent authority. Also the exploitation status of the main species has been declared, thus setting the legal benchmark to control access to the fisheries, considering that under the country's precautionary approach to fisheries management new entries are not allowed for stocks considered fully exploited (FAO, 2003).

2. Are fishing methods known to be harmful to habitats, to create by-catch problems, or whose high fishing capacity is difficult to control, being phased out?

Score: 5

Score Range: 2 - 7

The problem of fishing methods that create by-catch and/or damage fish habitats is tackled in at least three ways described in FAO (2003). First, management plans address selectivity of fishing gears and forbid the use of methods that reduce the selectivity of fishing gear. Second, destructive fishing methods and practices such as dynamiting and poisoning are forbidden. On the other hand, legislation has defined a 5-mile zone from the coast where access is closed to fisheries that use gears that can alter [impact] marine environmental conditions. At the Conference held in 2001 on Ocean Governance and Sustainable Development in Pacific Region, Peru was not listed under the countries that adopted measures to forbid driftnet fishing in the Territorial Sea/EEZ and in international waters by national ships (Rothwell, 2000). However, it is not clear how closely these regulations are observed.

3. Is by-catch of non-target species minimised?

Score: 5

Score Range: 3 - 8

The by-catch and discard of juvenile fish in the trawl fisheries for hake is recognized as problem that would benefit from research on more selective fishing technologies (Prado and Drew, 1999). The incidental catch and discard is monitored by programs of monitoring, control and surveillance (FAO, 2003). However, the status of shark populations [important components of incidental catch] has not been determined. Although the incidental capture of seabirds in longline fisheries is estimated to be low, a plan of action is in development to prevent seabird capture in case the longline fishery increases in size in the future (FAO, 2003).

4. Are discards minimised?

Score: 7

Score Range: 4 - 8

Kelleher (2004) estimates an average discard rate of 3.3% for Peru. The low value probably reflects the large fisheries for small pelagics, which are more selective. Nonetheless, Peru has other important fisheries with high discard rates, such as the hake and shrimp fisheries, the latter with discard rates of as much as 81% (Kelleher, 2004). This author also cites “a significant reduction” in discards in the hake demersal fisheries of Peru in the late 1990s because of the use of juveniles and other bycatch for surimi and fish blocks.

5. Is gear designed to minimise ghost fishing if lost?

Score: 0

Score Range: 0 - 5

No specific information: probably not.

6. Is the fishing of juveniles and spawners restricted to safe levels?

Score: 7

Score Range: 6 - 8

IMARPE monitors the proportion of juvenile anchoveta in purse seine catches along the coast and in cases where the level is higher than 10% of the total catch the fishery is closed in the corresponding area. Fishing closures are also adopted during the spawning season to protect hake and anchovy spawners (for example, Resolución Ministerial N° 040-2002-PE and N° 044-2002-PE).

7. Are depleted stocks being rebuilt?

Score: 5

Score Range: 2 - 6

According to the Peruvian report to FAO (2003), individual fisheries management plans contain measures to allow depleted stocks to recover. In cases where limits of allowable catch are being approached, the government considers it possible to restrict access, to reduce effort and to make changes in the private sector on the management systems.

Field 5: Social & Economic

1. Is the fishery managed so as to minimise conflict among different sectors?

Score: 7

Score Range: 4 - 8

There are moderate conflicts between coastal and industrial fisheries and between coastal fisheries and aquaculture (FAO, 2003). According to the Peruvian report to FAO (2003) there are mechanisms in place to solve the latter type of conflicts.

2. Are Indigenous Peoples rights and needs being met?

Score: 0

Score Range: 0 - 1

Peru does not recognize special rights for any of its many indigenous peoples. .

3. Are the needs of local fishing communities being met?

Score: 2

Score Range: 1 - 7

No specific information.

4. When changes to the management of the fisheries are made, is cost-effectiveness evaluated?

Score: 2.5

Score Range: 0 - 5

No specific information.

5. When a change to the management of the fishery is made, is its social impact evaluated?

Score: 1

Score Range: 0 – 5

No specific information.

6. Is funding for the research and the MCS programme obtained by cost recovery from the industry?

Score: 1

Score Range: 0 - 5

No specific information appears to be available.

Field 6: Monitoring, Control & Surveillance (MCS)

1. On a ten point scale, how effective is the observer scheme?

Score: 0

Score Range: 0 - 4

No observers are mentioned in FAO (2003) and it is likely that none are employed in Brazilian fisheries.

2. On a ten point scale, how effective is the catch inspection scheme?

Score: 4

Score Range: 2 - 6

Recognizing the importance of artisanal fisheries as the main supplier of fish for human consumption in the country and the many deficiencies in data collection for the sector, RESOLUCION MINISTERIAL N° 415-2001-PE establishes a System of Data Collection for Artisanal Fisheries landings. The effectiveness of this system is unknown.

3. On a ten point scale, how effective is the vessel monitoring scheme?

Score: 8

Score Range: 7 - 9

Peru has a system of surveillance, control and monitoring of fishing vessels by satellite (SISESAT) which provides information on industrial fishing activities. The system is used to monitor vessels with capacity larger than 32.6 m³ in the pelagic fisheries (FAO, 2003). The RESOLUCION MINISTERIAL N° 259-2001-PE, of July 2001, establishes a Commission responsible for evaluating the SISESAT.

4. Are vessels fishing illegally in the area of this fishery?

Score: 8

Score Range: 6 - 9

IUU fishing is recognized as a critical problem (FAO, 2003). According to the Peruvian report to FAO (2003), an action plan is being formulated to deal with IUU fishing, including measures of control and inspections and joint work with the coast guard. Informal estimates (Pauly, 1987; J. Csirke, pers. comm.) put the amount at around 30% for the anchoveta fishery; MRAG (2005) reports at least 60,000 tonnes unreported inshore. Pitcher *et al.* (2002) report, "True catches of Peruvian anchovy in the 1970s were similarly estimated after it was realized that fishmeal plants were operating well below the stated conversion efficiency (Castillo and Mendo 1987). Adjustments made after structured interviews with industry members resulted in estimates of catch much closer to the capacity of processing plants and with fishmeal exports. For example, the official 1970 catch figure of 12 million tonnes was revised upwards to 16 million tonnes, equivalent to 33%."

5. On a ten point scale, how effective is control of access in stopping illegal fishing?

Score: 2.5

Score Range: 2-4

To avoid illegal fishing in the Peruvian jurisdiction, FAO (2003) reports that systems of monitoring, control and surveillance have been established, including the monitoring by satellite with the participation of the coast guard and also the boarding of inspectors.

However, MRAG (2005) cites a number of problems: for example, "...The high seas fishery for Jumbo flying squid (*Dosidicus gigas*) off the coasts of Peru and northern Chile has also raised some concern. FAO statistics show that the China is a recent entrant into this fishery, taking a reported 81,000 t of squid in 2003. This compares to 40,000 caught by Japan and 5000 tonnes caught by Korea, mainly within the Peruvian EEZ under licence. Although the main fishery takes place in Peruvian waters, some of these catches are from high seas waters (up to 300 nm from the coast³⁹), and are therefore unregulated (there are currently no high seas RFMOs which regulate significant squid fisheries: only SEAFO and CCAMLR are capable of doing so). Recent arrests indicate that at least some of the Chinese catch, possibly about 40,000 tonnes (our estimate), is taken in high seas waters. ... Fishing News International (FNI) reported on the arrest of 9 Chinese squid jiggers fishing illegally in Peruvian waters and transshipping to reefers in international waters (Anon, 2005)²¹. Recent annual catches of Jumbo flying squid in the SE Pacific have been in the region of 50,000 t to China, 70,000 to Japan, 20,000 t to Korea and more than 100,000 t to Peru (FAO, Fishstat, 2002). If these jiggers had been operating in Peruvian waters for a month, then at average catch rates of 40 t/day (a modest jigger catch rate), they may well have taken 7000 tonnes of squid or more, worth about US\$8M."

6. Are vessels that really derive from this jurisdiction reflagged in states of convenience, generally to avoid reporting or other fishery regulations?

Score: 3

Score Range: 1 - 3

According to FAO (2003), there are no vessels from Peru operating in waters of other countries or in international waters. Also, Peru is not listed by the ITF or among the top countries where registered owners of FOC vessels are known to be based (Greenpeace, 1999). Peruvian legislation establishes that when Peruvian boats operate in other jurisdictions they must follow the accepted norms of that country, and international rules when operating on the high seas. Peruvian vessels are also obliged to report their catches and fishing areas and to have a system of satellite monitoring operating in the same way as in national waters. However, Gianni *et al.* (2005) mention Peruvian ports as providing supplies or services to refrigerated cargo vessels known to be involved in trans-shipment and delivery of illegally-caught fish into the Japanese market.

References

- Castillo, S. and Mendo, J. (1987) Estimation of unregistered Peruvian anchoveta (*Engraulis ringens*) in official catch statistics, 1951-1982. Pages 109-116 in Pauly, D. and Tsukayama, I. (eds.) The Peruvian anchoveta and its upwelling ecosystem: three decades of changes. ICLARM Studies and Reviews 15.
- Gianni, M. and Simpson, W. (2005) The Changing Nature of High Seas Fishing: how flags of convenience provide cover for illegal, unreported and unregulated fishing. Australian Department of Agriculture, Fisheries and Forestry, International Transport Workers' Federation, and WWF International. 83pp.
- FAO (2003) Summarized extracts on the status of implementation of the Code of Conduct for Responsible Fisheries. 25th Session, 24 - 28 February 2003.
- Kelleher, K. (2004) Collateral damage: Discards in the world's marine fisheries. An update. FAO Technical Report 470: 131pp.
- MRAG (2005) Review of Impacts of Illegal, Unreported and Unregulated Fishing on Developing Countries. Marine Resources Assessment Group, London, UK, 180pp.
- Pauly, D. (1987) Managing the Peruvian upwelling ecosystem: a synthesis. Pages 325-342 in Pauly, D. and Tsukayama, I. (eds) The Peruvian anchoveta and its upwelling ecosystem: three decades of changes. ICLARM Studies and Reviews 15.
- Pitcher, T.J., Watson, R., Forrest, R., Valtýsson, H. and Guénette, S. (2002) Estimating Illegal and Unreported Catches From Marine Ecosystems: A Basis For Change. *Fish and Fisheries* 3: 317-339.
- Rothwell, D.R. (2000) The General Assembly Ban on Driftnet Fishing. Pages 121-146 in Shelton, D. (ed) *Commitment and Compliance: The Role of Non-Binding Norms in the International Legal System*. Oxford, UK.
- Zapata, A. and Broad, K. (2003) Peru Country Study. In *Reducing the Impact of Environmental Emergencies through Early Warning and Preparedness: The Case of the 1997-98 El Niño*. UNEP.
-