

# The precautionary principle in fisheries management under climate change: How the international legal framework formulate it?

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**Abstract.** One of the objectives of fisheries management is to reach long-term sustainable benefits of the fish stocks while reducing the risk of severe or irreversible damage to the marine ecosystem. Achieving this objective needs, the good scientific knowledge and understanding on fisheries management including scientific data and information on the fish stock, fishing catch, distribution, migration, the proportion of mature fish, the mortality rate, reproduction as well as the knowledge on the impact of fishing on dependent and associated species and other species belonging to the same ecosystem, and further the impact of climate change and climate variability on the fish stocks and marine ecosystem. Lack of this scientific knowledge may lead to high levels of uncertainty. The precautionary principle is one of the basic environmental principles needed in overcoming this problem. An essence of this principle is that, in facing the serious risk as a result of the limited scientific knowledge or the absence of complete evidence of harm, it should not prevent the precautionary measures in minimizing risks and protecting the fish stocks and ecosystem. This study aims to examine how the precautionary principle in fisheries management be formulated into the international legal framework, especially under the climate change framework.

## 1. Introduction

Since the second half of the 1940s, the problem of over-fishing has been on the international agenda, yet international fisheries law well into the 20<sup>th</sup> century focused on “congestion, conservation, or fishing rights”. Conservation, in terms of the body of law, is referred to “the aggregate of measures rendering possible the optimum sustainable yield from those resources so as to secure a maximum supply of food” and did not encompass the environmental consequences of fishing activities. During the latter part of the 20<sup>th</sup> century, it became abundantly clear that international fisheries policy and law had not been particularly successful at the conservation of fish stocks and evidence emerged that fishing activities were negatively impacting the environment. Moreover, climate change also has accelerated environmental degradation, especially the marine environment. Therefore, in the context of international environmental instruments, during the 1990s, it started to address the issues related to fisheries management. As a result, the international law of fisheries, if not the practice of over-fishing, has changed considerably. The introduction of the precautionary principle and, related thereto, ecosystem-based management approaches are amongst the most important substantive changes. In



institutional terms, the most important development is probably the introduction of a general international law to regulate high seas fisheries and thereby curtail the freedom of fishing.

The Precautionary Principle has been widely incorporated, in various forms, in international environmental agreements and declarations and further developed in a number of national laws. An element common to the various formulations of the precautionary principle is the recognition that lack of certainty regarding the threat of environmental harm that should not be used as an excuse for not taking action to avert that threat.

This article would like to describe how the international legal framework formulates the precautionary principle, especially in fisheries management.

## 2. Literature review

### 2.1 *The concept of precautionary principle*

There is no clear and uniform understanding of the meaning of the precautionary principle among states and other members of the international community. At the most general level, it means that state agrees to act carefully and with foresight when making decisions, which concern on the activities that may have an adverse impact on the environment. A more focused interpretation provides that the principle requires activities and substances which may be harmful to the environment to be regulated, and possibly prohibited, even if no conclusive or overwhelming evidence is available as to the harm or likely harm that they may cause to the environment [1].

A more fundamental change would be adopted by an interpretation of the precautionary principle, one increasingly wide held, which would shift the burden of proof. According to traditional approaches, the burden of proof currently lies with the person opposing an activity to prove that it does or is likely to cause an environmental damage. A new approach, supported by the precautionary principle, would tend to shift the burden of proof and require the person who wishes to carry out an activity to prove that it will not cause harm to the environment. This interpretation would require polluters and polluting states to assert that their activities and the discharge of certain substances would not adversely or significantly affect the environment before they were granted the right to release the potentially polluting substances or carry out the proposed activity.

### 2.2 *The concept of fisheries management*

There is no generally accepted definition of fisheries management. One of the sources that provide the definition is FAO Technical Guideline for Responsible Fisheries, which state that [2]:

“...the integrated process of information gathering, analysis, planning, consultation, decision-making, allocation of resources and formulation and implementation, with enforcement as necessary, of regulations or rules which govern fisheries activities in order to ensure the continued productivity of the resources and the accomplishment of other fisheries objectives.”

From that definition, it can be seen that fisheries management embraces a complex and wide-range set of tasks, which collectively have the achievement of sustained optimal benefits from the resources as the underlying goal.

A good management requires data and information as a basis for all stages process begun from the formulation of the policy, development management plans, evaluation progress until updating policy and planning to provide continuous improvement. Based on FAO Technical Guidelines for Responsible Fisheries, the information that feeds into a fishery management plan should include: (1) the area of operation of fishery and its jurisdiction; (2) the various stakeholders; (3) the gear and vessel types to be employed in fishery; (4) the history, management, and socio-economic importance of fishery; (5) if possible, the distribution area of the most commercial species in the catch; (6) the relevant information about the life histories of species; (7) the effects of fishery on the recruitment, abundance, spatial distribution and age or size structure of the target species, as far as possible; (8) any

available monitoring data; and any management procedures already in place, with descriptions and a performance evaluation [2].

### 3. Result and discussion

In the fisheries management context, the precautionary principle has been recognized in several international instruments.

#### 3.1 The 1982 United Nation Convention on the law of the sea

The 1982 United Nation Convention on the Law of the Sea (UNCLOS) has implied the precautionary approach in fisheries conservation. Article 61.2 asserted that [3]:

“...the Coastal State, *taking into account the best scientific evidence* to it, shall ensure through proper conservation and management measures that the maintenance of the living resources in the exclusive economic zone is not endangered by over-exploitation...”

Although this article lacks any express reference to the precautionary principle, it already implied a precautionary approach to fisheries conservation [3]. This article obligates to the Coastal State to take into account ‘the best scientific evidence available’ in determining fisheries conservation and management measures. This formulation would raise the question ‘whether, in the absence of convicting scientific evidence, measures should be designed to ensure continued exploitation or to ensure conservation [4]. It is then argued that the UNCLOS provisions, by making conservation as the primary obligation, place a presumption in favor of conservation on the potential exploiter. The scientific evidence must be adduced to show that projected harvesting meets the requirement to maintain or restore populations at a level that can produce a maximum sustainable yield (MSY), rather than the other way around. In other words, if an adequate scientific evidence is not available, the primary conservative obligations of UNCLOS prevail [4].

Maximum sustainable yield (MSY) is also not defined by UNCLOS but is generally defined as the largest annual catch or yield of a fishery that can be taken continuously from the stock, based on the renewability of the resource, however, the concept is widely criticized because of the difficulties in determining MSY in practice, due to the natural variability of stocks and other uncertainties. Besides, it is seen as largely inadequate to the task of managing an already fully exploited or even declining resources and ignores the effects of fishing on non-target species [5].

MSY is a biological concept defined as the largest annual catch that can be taken continuously from the stock. It thus marks the upper limit beyond which harvesting levels are no longer sustainable. If this strict biological limit is to be ‘qualified’ by environmental and economic factors, this can only be in terms of lower catch levels than the concept of MSY would actually permit. Higher catch levels are *per se* contrary to the concept and cannot pass for a qualification. Besides, catch levels beyond MSY would naturally prevent the maintenance or restoration of populations ‘at levels which can produce the maximum sustainable yield’ (Article 62(3)). By definition, a stock or population that is exploited beyond the MSY level cannot continue to produce the same catch levels. Levels of harvesting beyond MSY are therefore contrary to the primary obligation contained in Article 61(3) [6]. Moreover, continuous catch levels beyond MSY would inevitably lead to over-exploitation and eventually contradict the general obligation under Article 61(2) UNCLOS, once populations become endangered.

According to Article 61(1) UNCLOS, the coastal state ‘shall determine the total allowable catch of the living resources in its exclusive economic zone’. While, Burke suggests that the purport of this provision is to enable only the coastal state, to the exclusion of other entities, to determine the allowable catch in its EEZ [7]. The language is clearly mandatory. Besides, as Article 56(1)(a) UNCLOS attributes to the coastal state exclusive sovereign rights for the conservation and management of natural resources in its EEZ, Burke’s interpretation would render Article 61(1) meaningless.

Burke further argues against a legal obligation to determine the total allowable catch (TAC) that especially developing countries may not be able to establish the requisite scientific basis [7]. However, Article 61(1) UNCLOS is only concerned with the basic duty to limit resource exploitation, not with pertinent data requirements. The latter issue is left to Article 61(2), calling on the coastal state to ‘take into account the best scientific evidence available to it’ in taking conservation and management measures, which seems easy but it is a small burden.

The wording of Article 61(1) UNCLOS appears to suggest that a total allowance catch (TAC) must be established for every fish stock within the EEZ [34]. However, the use of the term ‘resources’, rather than ‘stocks’ or ‘species’, may imply that the obligation applies only to such stocks or species that are affected by exploitation [8]. On the other hand, the determination of total allowance catch (TAC) is a requisite for the identification of the potential surplus that exceeds the coastal state’s own harvesting capacity and must be made available to foreign fishing vessels [9]. When it is alleged that a coastal state has arbitrarily refused to determine the TAC and its harvesting capacity at the request of another state with respect to stocks which other states are interested in fishing, the dispute is subject to conciliation (Article 297(3)(b)(ii) UNCLOS). This implies that a coastal state would have to determine the TAC for a stock that is of interest to other states, even though it is not harvested by the coastal state itself. Yet the conciliation provision supports the view that the obligation to establish a TAC does not apply to all living resources in the EEZ, as it appears ‘highly unlikely that a dispute would arise over a failure of the coastal state to determine an allowable catch for a species or population that is only of theoretical interest for harvesting’ [8]. This interpretation is also supported by practical considerations.

Article 61(2) UNCLOS requires the coastal state to take ‘into account the best scientific evidence available to it’ in determining conservation and management measures, albeit not to base its action solely on such evidence. Limited data are sufficient, as long as they are the best available to the coastal state. Thus, there is no expression of a positive duty on coastal states to undertake scientific research. However, the primary obligation to conserve the living resources in the EEZ ‘reasonably imposes the burden of acquiring data that make this obligation achievable’ within the limits of the coastal state’s financial resources. In any case, the ‘available’ data are not only the data generated by the coastal state but includes the data from other sources, such as other states involved in the fishery and international organizations, that can reasonably be obtained. Article 61(5) UNCLOS places a positive duty on all states participating in a given fishery ‘where appropriate’ to exchange a range of scientific information and the data relevant to the conservation of fish stocks on a regular basis through competent international organizations.

### *3.2 The 1995 United Nations Fish Stocks Agreement*

The 1995 United Nations Fish Stock Agreement (hereinafter called as ‘Agreement’) marks a significant shift of emphasis and approach and remains probably the most important of many international fisheries agreements [10]. The Agreement establishes obligations for signatory States that affects both management within national waters of straddling or highly migratory stocks and management of high seas stocks by the international and regional fishing organizations. Within these constraints, The Agreement provides a legal basis for the application of several of the most important provisions of the United Nations Food and Agriculture Organization (FAO) Code of Conduct for Responsible Fisheries 1995.

Environmental considerations are strongly highlighted in the preamble of The Agreement, and its effects throughout the operative provisions. The Agreement is the first international agreement requiring a precautionary approach to fisheries management. Article 6 of The Agreement requires that to preserve the marine environment as well as protect marine living resources, the precautionary approach should be applied in conservation, management, and exploitation measures. It includes requirements that States apply a prescribed methodology for precautionary measures (set out in Annex II), implements improved techniques for dealing with risk and uncertainty, takes into account both ecological and socio-economic uncertainties, and develops research and monitoring programs and

plans aimed at conserving non-target and dependent species. Annex II sets out guidelines for precautionary measures based on the establishment of reference points, and actions to be taken when such points are approached and exceeded. Reference to maximum sustainable yield (MSY) is retained in Annex II guidelines, but as a limit reference point, constraining harvest, rather than a target for management.

### *3.3 The 1995 FAO code of conduct for responsible fisheries*

The FAO Code of Conduct for Responsible Fisheries (hereinafter called as ‘the Code’) includes an exhortation to apply the precautionary approach (this Code use the term ‘precautionary approach’ rather than ‘precautionary principle’) widely in the conservation, management, and the utilization of living aquatic resources, directed as States, sub-regional, and regional fisheries management organizations and arrangements. While the code of conduct is voluntary, it is widely supported by most of the States. However, although most of the States have signed up to the Code, progress at implementation has been slow [11].

The technical guidance for implementation of the precautionary approach has been developed by the FAO. These guidelines represent probably the most detailed treatments of the operational meaning of precautionary in a natural resources management or conservation arena and offer valuable lessons for other sectors. The FAO guidance first characterizes the general concept of the precautionary approach, setting out that the precautionary approach requires, inter alia:

- Avoidance of irreversible changes;
- Prior identification of undesirable outcomes;
- Initiation of corrective measures without delay;
- Priority is given to conserving the productive capacity of the resource;
- Harvesting and processing capacity commensurate with estimated sustainable levels of the resources;
- That all fishing activities have prior management authorization and are subject to periodic review;
- Legal and institutional frameworks for fisheries management, with management plans implementing the above for each fishery;
- Appropriate placement of the burden of proof through meeting these requirements.

Detail guidance is then developed for the implementation of the precautionary approach in relation to fisheries management, research, technology development/transfer, and species introductions, including management planning and design, monitoring, stock assessment methods, review and evaluation of new technologies, and cooperation and information system on invasive species. The FAO continues to actively develop the precautionary approach, developing guidance across a range fisheries [12,13,14]. The precautionary approach has also been endorsed by and incorporated into ongoing work under FAO auspices on developing guidance for the ecosystem approach to fisheries [15].

## **4. Conclusion**

Precautionary principles have been applied to international conventions, particularly those related to fisheries management. However, this principle still needs operational rules so that it can be applied to the national law and become effective in order to achieve fisheries management objectives.

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