

The Impact of Overfishing on Environmental Resources and the Evaluation of Current Policies and Future Guideline

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ABSTRACT

The phenomenon of overfishing was first documented in the 19th century, when it was discovered that whale fat could be used to make lamp oil. This led to a huge increase in whaling, brought the species to the brink of extinction. Shortly thereafter, in the middle of the 20th century, some of the most common fish, such as herring, sardines and cod, were also overfished to extinction. And in this paper, the overfishing problems in Cape Cod is used as a case study as explanation. Some vicious effects did happen in the Cape Cod: decimated marshes due to a sharp decline in predators, and the economic decline of cod fishing. However, due to a series of economic production and fisheries unsustainable problems continued to arise. Indeed, the problem of overfishing was even worse and got into a vicious cycle. Not only for this aspect, liberalism also ran deep in overfishing. Along with the spread of liberalism, there were growing calls for market liberalization. And eventually, the government could not afford to regulate it and the privatization of the fishery industry grew. Privatization, in this case, had not effectively solved the problem, but had expanded the area of overfishing. Overfishing did not begin to improve until policies were introduced in the late 20th century. These results offer a guideline for our analysis of overfishing problem and further perspectives.

Keywords: *Overfishing, Liberalism, Climate Change, Privatization, Entire Eco-system, Industrialization, History.*

1. INTRODUCTION

Overfishing refers to the removal of certain types of fish from water bodies at a rate that the species cannot replenish, resulting in a sparse population of these species in the area. Compared to climate change, air pollution, or water pollution, the issue of overfishing is frequently overlooked. Even if this happens or it is a warning for the depletion of more marine resources in the future, Human beings are still overfishing many species because they desire more wealth, which is overwhelmed and greedy for the ocean.

Contrary to popular belief, modern fishing is no longer a profession left to chance and the eye of god. Sophisticated fishing tools allow fishermen to catch fewer fish and reduce their chances of escaping, which can harm the reproduction of fish. Commercial fishing usually involves casting nets between two boats, while fish are unable to swim backward. Therefore, once they are caught in the net, there is no escape unless they are small enough to fit through the net's mesh. Fully 25 percent of the world's fisheries are at risk of collapse

because of overfishing, and over 70% of the world's fish populations are either fully exploited or depleted. Meanwhile, global warming has further affected the development of global fisheries, forming a vicious circle.

This paper will mainly introduce and analyze a series of related problems of overfishing. Besides, Cape Cod as a very representative case of overfishing will also be mentioned to demonstrate the overfishing development around the world and give a brief introduction to Cape Cod. The next part is the detailed analysis of The negative impact of overfishing On the Natural environment, and the third part will discuss the main reasons for overfishing. The last part is the deconstruction of the effectiveness of existing relevant policies, as well as the combination of international relations theories (e.g., liberalism).

2. THE HISTORY OF OVERFISHING

This section will focus on a series of processes that led to the emergence and development of overfishing

throughout history, resulting in the case that will be analyzed in this article: Cape Cod.

2.1. The Development of Overfishing

Overfishing was first documented in the 1800s when people discovered that whale fat could be used to create lamp oil. This resulted in a massive increase in whale fishing, which brought the species to the brink of extinction [1]. Afterward, in the middle of the 20th century, some of the most commonly eaten fish such as herring, sardines, and cod, were also wiped out because of overfishing. There is no doubt that each fish plays an important role in the biological cycle, and when their regional consumption accumulated, would make a devastating effect on global ecology and fisheries markets.

In the middle of the 20th century, the problem arose mainly because the international community of ways and means was actively trying to provide consumers with foods rich in protein, and Marine products were the first to do so. The government has been trying to improve the efficiency of the fishing industry by developing new and better fishing tools. Preferential policies, loans, and subsidies are given to private companies and commercial fleets, which increase their frequency and motivation to go out to sea and use increasingly sophisticated methods to ensure that fish of all kinds cannot escape. More fish products are available for purchase, and consumers are used to buy a wide range of fish at affordable prices.

However, things did not go as people had expected. Oceanographers have long known that excessive fishing leads to overfishing, which is very damaging to the environment. By 1989, when about 90 million tons (metric tons) of catch were taken from the ocean, the industry had hit its high-water mark, and yields have declined or stagnated ever since [2]. Fisheries for the most sought-after species (e.g., orange roughy, Chilean sea bass, and bluefin tuna) have collapsed. Faced with the collapse of large fish populations, commercial fleets are going deeper in the ocean and farther down the food chain for viable catches. This so-called "fishing down" is triggering a chain response that is upsetting the historic and subtle stability of the sea's biological system.

2.2. Overfishing Could Be The problem for climate change

The ocean is a complex ecosystem with a series of interactions between different species. From the slow-growing corals and sponges that provide food, safe havens for fish to reproduce and grow, to the phytoplankton that absorb carbon and support the food web, every link in the Marine food chain is crucial to maintaining ocean abundance. When the oceans are bountiful, they can continue their vital yet often

unacknowledged role as a chief climate regulator. However, when they are emptied, that ability wanes [3].

While scientists have long been aware of the decline of Marine communities, there has been little research on how fishing or finning affects ecosystem-level processes, including climate change. The loss of predators can lead to large-scale ecosystem effects, including an increase in biological carbon dioxide in the ocean. Since most commercially caught fish are predators, fishing and finning have led to a rapid decline in the number of predators in Marine ecosystems. This removal of predators is likely to increase ocean ecosystems' CO₂ production, and ultimately that fishing and shark finning are contributing to climate change [4].

3. THE CAPE COD CASE STUDY

3.1 A Review of Overfishing On Cape Cod

The Cape Cod research is one of several that indicate that overfishing (including recreational fishing) has serious repercussions. The Cape Cod is a geographical promontory that extends from the southeastern corner of the Massachusetts mainland in the northeastern United States to the Atlantic Ocean. As the name suggests, the marine resources here, especially the fishery, are very developed. For many years, cod has been and will continue to be the staple food of the United States and other European and American countries. Millions of pounds of cod, mackerel, and other seafood are sent throughout the world every year [5]. From the unloading of the catch through the processing of the fish to the transportation business that transports the fish to the grocery shop that keeps food and supplies onboard.

According to a case study done on Cape Cod, once the predator population is overfished due to recreational fishing, the swamp's coastal flora would die faster [6]. In other words, fishermen's overfishing of top-of-the-food-chain fish has resulted in a significant increase in the number of Sesarma. Sesarma may breed and eat freely without predators, resulting in the destruction of the shoreline. The situation of Cape Cod is a thought-provoking example of a larger issue: overfishing.

3.2 Important Salt Marshes Along Cape Cod Are Rapidly Diminishing

Recreational fishing is a major contributor to the rapid decline of important salt marshes along Cape Cod because it strips top predators such as striped bass, blue crabs, and smooth dogfish out of the ecosystem according to new research by Brown University ecologists. Salt marshes are vitally important because they protect coastlines from erosion, filter pollutants headed from land to sea, and act as nurseries for the young of many species of crabs and fish. With far fewer predators in areas where recreational fishing is prevalent, native Sesarma crabs have had relatively free

rein to eat salt marsh grasses, causing the ecosystem to collapse. As recreational fishing activity has reduced predators in many of Cape Cod's salt marsh ecosystems, Sesarma crabs have feasted on grasses, causing dramatic die-offs of the marshes [7].

3.3. The Plight Of Fishermen On Cape Cod

Due to overfishing, cod stocks are nearly depleted. To avert complete collapse, the National Oceanic and Atmospheric Administration now set limits on fish catches or quotas. In the past decade, catches have plummeted, from 100 million pounds of cod in the early 1980s to a fraction today. At the same time, the Gulf of Maine, a frigid inlet between Cape Cod and Nova Scotia, has been warming faster than 99.9 percent of the global ocean. As cold-water species like lobsters move north, fishermen return empty-handed, waiting for blue crabs in warm water to eventually take their place. Cape Cod is out of cod. But fishermen have learned to adapt, so now they're catching other species that are moving north as the water warms and are becoming more common in our waters.

4. THE REASONS FOR OVERFISHING

4.1. Fishing Tools Caused Overcapacity

As we can see from Section two how overfishing affects the environment, the question arises: How did overfishing come to have such an ecological impact? The scientists attributed it all to two main factors: the rapid evolution of fishing tools and the nutritional and economic needs of a growing population. The first factor of overfishing is overcapacity. Worldwide, many fisheries industries have large ships, equipment, and technologies that can be deployed to the depths of the ocean. They can stay at sea for weeks or months, and even process the fish before returning to shore. Experts believe that all the equipment in the world combined is enough to fish on four terrestrial planets.

The second factor is unsustainable fishing. Continuous improvement of fishing tools involves the use of nets, fishing methods, and other equipment to catch too many fish to the point of extinction. It also involves catching by-catch other than fish in the process. By-catch, which can include cetaceans, turtles, corals, and invertebrates like starfish, crabs, and sea urchins, is frequently killed and tossed back into the sea. This situation is abundant in the ocean, suffers reproductive harm as a result of such captures. To sum up, both of these two conditions are ascribed to the development of innovative fishing tools, which has led to the overfishing of fish in the ocean.

4.2 Economic Growth and Globalization

According to the United Nations, it took more than a century for the world's population to grow from 1

billion to 2 billion, and 32 years for it to grow from 2 billion to 3 billion [2]. Since 1987, it has been increasing by 1 billion every 12 years. Thus, there are increasing economic and food needs. The number of fish brought ashore by the fishery depends on the market and consumer demand. In the past century, human beings have multiplied, and their demand for food and fish has also multiplied. Coupled with the economic ambitions of fisheries, they force them to catch more fish than the ocean can replace. Overfishing exists, but as the numbers decline and the cost of fishing becomes higher, people face two choices: reduce the amount of fishing or look for alternatives. As things stand, people are choosing the latter. Instead of stopping overfishing, they continue to consume other species of fish and the consumption is not endless undoubtedly.

Another point worth mentioning is that globalization is often mentioned in the issue of overfishing. Although different groups of people have different views on the pros and cons of globalization, there is no doubt that globalization as an ongoing process will continue to develop and be implemented. Existing FAO research shows that the fisheries sectors of many countries have and continue to benefit from globalization [6]. Nevertheless, from another point of view, the marine products exported to European and American countries are low in price and large in supply, which also has a certain impact on the local fishery market.

5. POLICY BASED EXPLANATION OF OVERFISHING

5.1. The Policy Addresses Overfishing In The United States

In the United States, in order to effectively eliminate something like Cape Cod, Congress has issued a series of bills to deal with the problem: mainly the Magnuson-Stevens Act, the Endangered Species Act, the Marine Mammal Protection Act, and the National Environmental Policy Act. The first act aimed to prevent overfishing, rebuilt overfished stocks, increased long-term economic and social benefits, and ensured a safe and sustainable supply of seafood. The Endangered Species Act and Marine Mammal Protection Act govern and protect endangered species and important habitats in the ocean, such as walrus and manatees. The principles of national environmental policy were to promote better decision-making, took into account all environmental impacts of actions, and involved the public in decision-making to effectively improve the ecological environment.

5.2. The Role of Liberalism In Policy Making

Liberalism was partly reflected in policy, not just in international policy statements. Neoliberal policymakers argued that trade liberalization was necessary to increase export output, made domestic production and

imported more competitive, and reduced debt burdens. Mexico tax rate on international trade had fallen from about 30 percent before the reforms to 8.6 percent, Chile 12.5 percent and Peru 14.8 percent. Crucially, however, production for overseas markets came at the expense of domestic consumers because export tariffs are zero. Ultimately, the fisheries sector was not immune to privatization pressures. In Chile, the important northern far-water fishing industry was privatized between 1974 and 1978. One consequence of such privatization had been the rapid concentration of industry, the main beneficiaries of which had been the main fishing groups. The role of major groups in the formulation of fisheries policy had been strengthened as income from fisheries enabled them to reinvest outside the sector. Nevertheless, due to increasing industrialization, excessive profit-oriented overfishing had led to growing environmental problems. In the worst cases, it led to a sharp decline in local fish populations, even shorten menstrual cycles, and cause eutrophication of seawater [8].

In this case, a new law was introduced. Under the United Nations Convention on the Law of the Sea, the 200-mile Exclusive Economic Zone (EEZ) gave coastal states the right to expand fishery jurisdiction, promoted permits and/or prohibited foreign fleets from entering their waters. In Mexico, the focus of neoliberal criticism was the historic "unfair" monopoly of resource rents by fisheries legislation. Meanwhile, the Ejidos was born. In this case, Ejidos were Mexican communes where the government used public land for agriculture. In the 20th century, Ejidos was controlled by the Mexican government. During the post-Mexican Revolution, the Mexican government distributed land to peasant communities as a means of containing social unrest. Members of the commune have use of the land, not ownership. Also, Ejidos granted made farmers dependent on the government and created a bureaucracy to register and manage them through the national Agricultural Registry [9].

Under a 1949 law, Ejidos cooperatives were granted exclusive access to nine of the countries' most important offshore Marine and shellfish fisheries. The 1986 Federal Fishing Act expanded, rather than reduced, these rights, giving cooperatives exclusive rights to nine "reserved" species, but the 1989 amendment subsequently eliminated these rights. Furthermore, it was only recently that the Peruvian Fisheries Authority brought fisheries capital into state management after the collapse of anchovy stocks in 1972/3. In an effort to pre-empt neoliberal concerns, the government of Peru enacted the 1994 Fisheries Ministry General Act [10].

Although liberalism is bad for the environment of trade and fishing markets, a reasonable free trade market can improve our society in some ways, which is a double-edged sword. Liberal markets, if not properly regulated, can lead to recessions as they have in the past. After a series of traumas and setbacks, the

international community will use liberalism as a tool to complement free trade and international regulation and to come up with a greener, profit-maximizing set of decisions.

6. CONCLUSION

In short, overfishing affects the entire ecosystem from both environmental and physiological aspects. It can change the size of the remaining fish, as well as the way they reproduce and the rate at which they mature. When too many fish are taken from the ocean, it creates an imbalance that erodes the food web and leads to the loss of other important Marine life. At the same time, the indulgent liberalism will lead to the peak of fishery profit pursuit, which will further lead to the uncoordinated industrial chain, even beyond the international tolerance range. Under the interaction of the two, the profits of the fishing industry have decreased year by year, and the environment has been greatly damaged. However, researchers believe that as the international community continues to analyze the problem, the new policies will be more and more close to the fairness of the industrial chain and the sustainability of the ecology. The contribution of this paper is to explore the effects and causes of overfishing on Cape Cod in many ways, as well as a liberal policy analysis of future policy responses based on the current situation of overfishing. This article is a small contribution to the global research on Marine resources and environmental protection. It is believed that through the analysis of the disastrous effects of overfishing in the Cape Cod waters and its causes, this article can fully arouse people's attention to Marine protection. It also offers some suggestions for future policy on fishing grounds in the Atlantic. Of course, this article have put forward arguments that might not be enough mature, and the Angle is single, we just start from Cape Cod, this example analysis and put forward their own views, in this world, there are still many other the fishery was confronted with a serious problem over fishing, they encountered problems exist differences compared with Cape Cod. In the future, we will continue to analyze the global overfishing problem from many perspectives, such realism and constructivism, starting with more cases of other fisheries in the world, and strive to continue to contribute to the global Marine environment. Overall, these results offer a guideline for conservation of overfished fisheries around the world.

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