OVERFISHING AND EXTINCTION RISK OF FISH SPECIES: A REVIEW STUDY

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ABSTRACT:
Fish food is an important nutritive food for human beings. It provides vitamins and minerals, including B vitamins, zinc, and iron. Some oily species of fishes contain omega-3 acids, which are beneficial fats that humans must obtain from their diet. The United States Department of Agriculture recommends that most people eat seafood twice weekly as part of a balanced diet. Several researchers have investigated the nutritional value of fish and its importance in human diet from various perspectives. Some studies revealed that fish consumption helps prevent cardiovascular diseases, high blood pressure, cholesterol, Alzheimer’s disease, and various types of cancer. Fish and fisheries products are actually recognized not only as some of the healthiest foods on the planet, but also as some of the less impactful on the natural environment (FAO). According to (FAOUN, 2019) over 1 billion people are still largely dependent on fish as their primary source of protein, with many of these being in developing countries with urbanized coastal areas. An increased demand for fish, combined with ever-growing world populations, sees our rivers and oceans struggle to keep up with the rate at which we are fishing from these water bodies. The global proportion of overfished fisheries has steadily increased from 10% (1974) to 32% (2008). Overfishing, a fundamental cause of the crisis facing our rivers and oceans, is the result of the failure of our fishing management. This paper focuses on current risk of ecosystem overfishing and increasing trend in the number of unsustainable fisheries.

Keywords: Overfishing, Species, Environment, Water resources

INTRODUCTION:
The issue overfishing is harvesting a fish stock on a large scale (catching too many fish at once), so the breeding population becomes too depleted to recover. When too many fish are captured from the ocean it creates an imbalance that can erode the food web and lead to a loss of other important marine life. An increased demand for fish, combined with ever-growing global populations our oceans cannot keep up with the rate at which we are fishing our seas (Daniel, 2019). Studies have shown that coastal fisheries declined,
the open oceans as a resource leading to an 80 percent decline in bluefin tuna (*Thunnus thynnus*) and swordfish (*Xiphias gladius*) in just five years in America.

According to (FAOUN, 2019) over 1 billion people are still largely dependent on fish as their primary source of protein, with many of these being in developing countries with urbanized coastal areas. Globally, fish provide 4.5 billion people with almost 15 percent of their intake of animal protein (Bene *et al*., 2015). It was claim that in (2016) alone 171 million tons of fish was caught, from combined sources of aquaculture and capture fish production. This fish production has increased at a rate of 3.2% each year since (2005), far out pacing the world population growth 1.6 percent (FAOUN, 2018). Due to increased demand for fish, combined with growing world populations, results over oceans struggle to keep up with the rate of fishing overseas. Overfishing with attendant bycatch problems, both from commercial fishing, recreational fishing, illegal unregulated or unreported fishing (IUU), and ghost fishing. The destructive impacts of fishing stem chiefly enter through overharvesting, habitat destruction, and bycatch. Over the coming century the threats posed by increasing atmospheric greenhouse gases pose huge dangers to the marine environment (Veron 2008, Koslov 2007). Human impacts on natural ecosystems are diverse and accelerating. The International Union for Conservation of Nature’s (IUCN) red list threatened species of aquatic organisms, species that have declined 50% within the most recent ten year or three generation period are considered to be threatened with extinction (IUCN 2011).

**DISCUSSIONS:**

The species and populations are the building blocks of any communities and ecosystem which sustain humanity through a wide range of services. Hoffmann *et al*., (2008) noted that there is increasing evidence that human impacts over the past ten millennia have profoundly and permanently altered biodiversity on land. The oceans encompass some of the earth’s largest habitats and longest evolutionary history, but there is mounting concern for the increasing human influence on marine biodiversity that has occurred over the past 500 years (Jackson, 2010). Overfishing and habitat degradation have profoundly altered populations of marine animals (Polidoro *et al*., 2012). Studies have predicted extinction risk, but few have made a priori predictions of risk. Throughout globe with increasing population pressures and changing methods of fishing practices creates severe impact on the natural water bodies and their ecosystems. Blast fishing can result in a crater-like reef landscape as substrate is destroyed (Yap, 2013). Overfishing in freshwater systems has caused severe reductions in many fish stocks, especially large species, including top predators and migratory fishes (Allan *et al*., 2005). Jackson (2001) noted that many of the fundamental alterations seen in ecosystems suffering from overfishing caused by the removal of key top-down regulators. International capture has led to overfishing of many species and the species have suffered greatly from unintentional catch. The commercial and recreational fishing can directly affect marine species by depleting the stock levels difficult or impossible to recover (Lascelles *et al*., 2014). Overfishing is replicated throughout the world’s oceans, where large predatory fish have been in sharp decline since the late 20th century (Myers & Worm, 2003). The studies shown that when coral reef fish communities have their top predators removed or depleted, the entire
ecosystem becomes unbalanced, leading to ecological disaster. The loss of keystone species may result in potential disruption to trophic structures and alter benthic diversity.

Is overfishing a new problem in the world

Throughout the globe seas and oceans are a vital source of animal protein from fishing and a major contributor to global food security. Shijie Zhou et al., (2013) has argued that global wild catch production has reached its limit, and there is concern that many species are overfished. Nearly 80 percent of the world’s fisheries are already fully exploited, over-exploited, depleted, or in a state of collapse. Worldwide 90 percent of the stocks of large predatory fish, such as sharks, tuna, marlin, and swordfish, are already gone (The World Counts). World capture fisheries production has been relatively stable for the past decade (FAO 2012). The world’s landings of marine species fluctuated between 7.77 and 8.04 9 107 ton from 2006 to 2011, with additional discards estimated at about 7.3 9 106 ton (Kelleher, 2005). Worldwide fishing effort continues to increase. Global data set of fishing effort reveals that fishing power has increased by an average of 10-fold globally and 25-fold for Asia since from 1950 (Watson et al., 2012). However, the effort in some developed countries has declined in recent years. Studies show that many commercially harvested fish stocks have been overfished, and overfishing continues for certain species of fish (Worm, 2009). The selectively catching of a specific ecological group generally reduces the abundance of that group in relation to the unfinished group.

According to a World Bank report almost 90 percent of global marine fish stocks are now fully exploited or overfished, and wild capture fisheries struggle without sound regulatory frameworks and strong enforcement. The status of marine biodiversity is closely connected with ocean pollution and acidification. About two-thirds of the world’s oceans showed signs of increased human impact. Driven by rising populations, higher incomes, and greater awareness of seafood’s health benefits, the demand for fish is twice the estimated supply of sustainably caught wild fish (FAO). Worldwide reports show that, in 2017, 34.2 percent of the fish stocks from the world’s marine fisheries were classified as overfished, a continuous increasing trend since 1974, when that figure stood at just 10 percent.

Status of overfishing

Globally the problem of overfishing is major and causes significant decrease in catches, negatively impacting ecosystem health and the sustainability of stocks. Accurate assessment of Fisheries Status is crucial to avoiding unacceptable harm to fish stocks, habitats, and ecosystems caused by overfishing. According to a report by FAO (2020) stated that in 2017, 34 percent of the fish stocks of the world’s marine fisheries were classified as overfished. Problem of overfishing has stripped many fisheries around the world of their stocks. The UNFAO estimated (2018) report that 33.1 percent of world fish stocks are subject to overfishing. According to a United Nations (2008) report, the world’s fishing fleets are losing US$50 billion each year due to depleted stocks and poor fisheries management. The Global Assessment Report on Biodiversity and Ecosystem Services published (2019) by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services, overfishing is a primary driver of mass extinction in the world’s oceans (Borenstein,
A study published (2021) in the Journal Nature asserted that the primary cause of ocean defaunation is overfishing (Pacoureau et al., 2021).

Problems of overfishing

It is estimated that at least 80 percent of the world’s monitored fisheries are overexploited. This has some serious implications for both ocean ecosystems as well as human beings. Overfishing causes problems due to use of advanced fishing techniques which are physically destructive and destroy the physical environment. Figures published by the UNFAO shows why overfishing is such a problem.

- 52% of fish stocks are fully exploited (misused)
- 20% are moderately exploited
- 17% are over exploited
- 7% are over depleted
- 1% is recovering from depletion

The above figures clearly show how much fish is misused. Increased demand for fish, combined with ever-growing global populations our oceans cannot keep up with the rate at which we are fishing our seas.

Pressure on oceans

When too much fishing is carried out in the oceans it creates an imbalance that can erode the food web and lead to a loss of other important marine life. Overfishing not only threatens a valuable source of food, but the entire marine ecosystem. Overfishing and climate change is disrupting the physics, chemistry and ecology of the ocean, with significant consequences on the life it holds (Rashid & Travis, 2020). Human society has had considerable and far-reaching impacts on the global ocean (Halpern et al., 2015), and overfishing has lasting effects on marine ecosystems and continues to be one of the greatest threats to ocean health (Gattuso et al., 2018). The indirect pressures of overfishing include habitat degradation and pollution. Habitat loss has implications for marine life, but will also affect other aspects of ocean health.

Threats to marine biodiversity

According to a FAO estimate, over 70% of the world’s fish species are either fully exploited. The dramatic increase of destructive fishing techniques worldwide destroys the entire marine ecosystem. Marine biodiversity is important for the survival and development of the human population, it affects various aspects of our living beings, and is suffering from the world’s rapid expansion of modern society and economy. At present, marine biodiversity faces various anthropogenic threats including pollution, eutrophication, overfishing, habitat alteration and global climate change (Bei Huang, 2015). Marine diversity is a provider of economic services which comes as a blessing to coastal people (MoE Report, 2011). Degradation and loss of habitat for marine flora and fauna may reduce the overall ecosystem services being provided by the coastlines. Fishing down the food web has been argued to cause a reduction in the number and length of the pathways in the food web, making the ecosystems less resilient to environmental fluctuations (Pauly & Maclean, 2003). IUCN assessments suggest that documented fish extinctions in the wild are relatively rare.
and surprisingly similar in the freshwater and marine realms – 69 freshwater species and 65 marine extinctions at global scale (Freyhof, 2016). A great number of species are continuously threatened with extinction or their status is unknown.

**CONCLUSION:**

Marine and freshwater overfishing unbalancing the natural ecosystems. Loss of habitat threatens the habitat with extinction risk of fish fauna. Stress on major ecosystems results in erosion of biodiversity. Conservation of the marine and freshwater fishes will require management and restoration strategies focused on species at the greatest risk of extinction. Lack of fishing regulations leads to overfishing when rural citizens have few other economic opportunities. So, community-based management development is essential. The levels of extinction present the most depressing part of global and national threats to marine and freshwater aquafauna. Uncontrolled activities in the marine and freshwater creates two serious problems: we are losing species as well as entire ecosystems. We are in the risk stage of losing a valuable food source which we depend on for social, economic and dietary reasons. Now, it is the time to follow strategies which need to incorporate ecosystems, together with population and community-level assessment. The continuous assessment aquatic ecosystems require to evaluate the sustainable exploitation of aquatic ecosystems.

**REFERENCES:**