

The Impact of Socio-Economic Factors on the Decline of Fishery Resources

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Abstract The decline of fishery resources poses a serious challenge to the global marine ecosystem and socio-economic system. Socio economic factors play an important role in this issue and have a profound impact on the health and sustainability of fishery resources. The closely intertwined relationship between fisheries and socio-economic factors has become increasingly significant in the current global environmental context. The impact of socio-economic factors on the decline of fishery resources is mainly reflected in the livelihoods of fishermen, the protection of fishery practitioners by social policies, and overfishing behavior caused by economic development pressure. Although economic development brings prosperity to society, it may also trigger excessive dependence on fishery resources, accelerating the decline of resources. This review focuses on elucidating how socio-economic factors directly affect the health and sustainability of fishery resources, providing a profound understanding and insights for developing more forward-looking and feasible fisheries management policies.

Keywords Fishery resources; Socio economic development; Ecological balance; Fishery activities; Resource decline

With the rapid growth of global population and the continuous evolution of socioeconomic systems, the sustainability of fishery resources has attracted increasing attention. The fragility of marine ecosystems is intertwined with the continuous expansion of social and economic activities, leading to the severe decline of fishery resources (Zhu and Qian, 2022). In this context, socioeconomic factors are considered important driving forces that cannot be ignored in fishery resource management.

The rapid decline of global fisheries resources has become a major focus on the current global environmental agenda. Factors such as overfishing, environmental pollution and climate change not only have a profound impact on marine ecosystems, but also place a heavy burden on communities around the world that rely on fisheries for their livelihoods. Over-exploitation of this resource and irresponsible fishing practices have exceeded the capacity of the natural system and caused irreversible damage to the socio-economic system. Socioeconomic factors play a key role behind the complex decline of fishery resources. The influence of fishery management policies, social policies, and economic development not only directly shapes the pattern of fishery activities (Wang, 2023), but also profoundly affects the livelihoods of fishermen and the sustainable development of communities. The interactive relationship between socioeconomic factors and fishery resources is not only reflected in the fishing and utilization process of resources, but also involves society's understanding of resources, the formulation of fishery policies, and the implementation of resource management.

Against this background, this review aims to provide an in-depth exploration of the impact of socioeconomic factors on the decline of fishery resources and analyze their complex impact on fishery sustainability. Researchers will focus on key elements of fisheries management policy, social policy, and economic development to analyze their interactions with fishery resource health. Through case studies on the decline of global fisheries resources, the study will highlight the key role of socioeconomic factors in shaping fishery activities, affecting fishermen's livelihoods and challenging sustainable fisheries management. This review aims to provide a comprehensive understanding for future fishery resource management and policy formulation to promote the organic integration of socioeconomic and fishery sustainability.

1 Socioeconomic Background of Fishery Resource Decline

Behind the decline of global fishery resources is fishery dependence caused by population growth and economic development, overfishing caused by poor policies, and the impact of climate change caused by social vulnerability. In this socioeconomic background, fishermen's livelihoods are threatened, community vulnerability is intensified, and economic pressure triggers overfishing, forming a vicious cycle of unsustainable fishery resources (Froese et al., 2023).

1.1 Definition and impact of fishery resource decline

The decline of fishery resources is a serious threat to the global marine ecosystem and human socioeconomics. The definition of this phenomenon is that due to the combined effect of multiple factors, including but not limited to overfishing, environmental pollution, and climate change, the number of fish, shellfish and other fishery resources in the ocean has decreased sharply (Rashid et al., 2023). This phenomenon not only has a lasting and far-reaching impact on the balance of the ecosystem, but also directly threatens the sustainable development of global fisheries and the economic prosperity of human society.

Overfishing is one of the main causes of fishery resource decline. Globally, fisheries are overly intensive and exceed the natural ability of fish to reproduce and grow. The unsustainability of this fishing has led to the decline of some key fishery resource populations, even pushing them to the brink of extinction. At the same time, unreasonable fishing methods have also exacerbated the excessive loss of resources, forming a vicious cycle. Environmental pollution is another important factor leading to the decline of fishery resources. Water pollution caused by industrial emissions, agricultural pollution, and coastal development directly threatens the living environment of fishery resources. This kind of pollution not only destroys the habitat and causes many fishery resources to lose their breeding and growth places, but also causes them to be polluted by various harmful substances, which has a negative impact on the quality of fishery resources.

Climate change is an emerging factor affecting fishery resources in recent years. Global climate warming has led to rising ocean temperatures and intensified acidification, which have had a profound impact on fish migration (Figure 1), breeding seasons and habitat selection. This has caused many traditional fishing areas to face changes in resource migration and distribution, bringing huge uncertainty to fishing activities.



Figure 1 Large numbers of fish migrating in the ocean

The decline of fishery resources has had a profound impact on human society and economy in many aspects. The economic losses are obvious, because fisheries are an important economic pillar for many countries and regions, and the depletion of resources has led to a sharp decline in catches, which in turn threatens the steady development of related industrial chains. Threats to fishermen's livelihoods further exacerbate the problem, as fishing is the main source of livelihood for many communities and the depletion of the resource directly affects the lives and employment of millions of fishermen. At the same time, the decline of fishery resources has also

triggered the collapse of ecosystems, and the loss of biodiversity has become an irreversible trend. This not only threatens the balance of marine ecology, but also has a direct impact on the global food chain and ecological balance. Social instability and competition for resources between regions have triggered conflicts, making the decline of fishery resources a global security issue.

1.2 The role of socioeconomic factors in the decline of fishery resources

In the complex background of fishery resource decline, socioeconomic factors are a key point. The relationship between socioeconomic factors and fishery resources is closely intertwined, and its status is that it directly shapes and affects all aspects of fishery activities (Liu, 2023). The decline of fishery resources is not only an ecological problem, but also a problem in the social and economic structure. Socioeconomic pressure directly drives overexploitation of fishery resources. The continuous growth of the global population and economic development have led to a rapid increase in demand for fishery products, and society's over-reliance on fishery resources has become one of the driving forces behind the decline of resources. This economic pressure makes fishing activities tend to pursue short-term economic benefits while ignoring the sustainability of resources.

In addition, fishermen's livelihoods are directly affected by socioeconomic factors. Social policies, employment opportunities and welfare systems are directly related to fishermen's income and living standards. In communities that lack social security, medical and educational opportunities, fishermen face greater economic pressure and may be inclined to adopt irresponsible fishing methods to maintain basic livelihoods, thus exacerbating the over-exploitation of resources. Fisheries management policies are also influenced by socioeconomic factors. Policy formulation and implementation are often influenced by social pressure and economic interests. If society's demand for fishery resources is too urgent, policies may tend to relax fishing restrictions too much and lack effective supervision, thus accelerating resource depletion. Socioeconomic factors also challenge the risks of sustainable fisheries management amid declining fishery resources. Unbalanced economic development and unfair distribution of social resources make some communities more vulnerable and more difficult to adapt to changes in resources. This may lead to over-exploitation of resources and illegal fishing, exacerbating the decline of fishery resources.

The impact of the decline of fishery resources on the socio-economic system cannot be ignored. The economic losses are obvious, as fisheries are an important economic pillar for many countries and regions. The depletion of resources has not only led to a sharp decline in fishing volume, but also threatened the steady development of related industrial chains. Social instability also becomes a possible outcome, as uneven distribution and reduction of resources can easily lead to social dissatisfaction and tension. In the context of globalization, the decline of fishery resources has had a wide-ranging impact on the international community. Resource depletion and instability may trigger resource competition between regions and even lead to conflicts. This makes the decline of fishery resources a global security issue, involving international relations and the stability of the global economy.

1.3 Case study on the decline of global fishery resources

Case studies on the decline of global fishery resources present a grim reality, highlighting the huge impact of socioeconomic factors on fishery resources. What deserves the most attention is the status of fishery resources in the North Atlantic. Over the past few decades, the North Atlantic was once one of the richest fishery resources, but due to overfishing, climate change and environmental pollution, the numbers of many fish stocks have declined sharply, including economically important species such as Atlantic cod. This recession not only had a huge impact on fishery practitioners, but also affected the economic development of related countries. Socioeconomic pressures drive fishermen to adopt irresponsible fishing methods, leading to further resource degradation.

Another notable case occurred in the Indian Ocean coastal countries of East Africa. The fishery resources in these areas have long been an important source of livelihood for local residents. However, due to the lack of effective fishery management policies, socioeconomic vulnerability, and the impact of climate change, the resources of many fisheries are facing the threat of collapse (Lu et al., 2021). Overfishing, illegal fishing and the use of destructive fishing methods such as bottom trawling have made the decline of fishery resources in the region more

serious. Social and economic difficulties force fishermen to adopt short-term profit-making strategies, which undoubtedly further accelerates the depletion of resources.

Peru in South America also provides a thought-provoking case. Peru's fishery was once the backbone of the country's economy, but due to long-term overfishing and fluctuations in fishery resources caused by climate change, Peru's fishery is in trouble (James et al., 2023). In particular, Peruvian herring, one of the main species in Peruvian waters, has experienced mass deaths due to abnormal sea temperatures caused by climate change (Figure 2), triggering a sharp reduction in fishery resources in the region. This phenomenon has not only dealt a heavy blow to Peruvian fishery operators and related industries, but has also had a knock-on impact on species such as whale sharks around the world that rely on herring as a food source.



Figure 2 A large number of Peruvian herring died on the coast

Together, these cases demonstrate the complexity and multifactorial nature of fishery resource decline on a global scale. Socio-economic factors play a key role in this. From economic development pressure to the lack of effective fisheries management policies, to social vulnerability and the impact of climate change, a series of intertwined issues make the decline of fishery resources a comprehensive one. challenge. These cases not only remind everyone of the need for global cooperation to formulate scientific and sustainable fisheries management policies, but also emphasize the importance of socioeconomic factors in protecting and maintaining fishery resources.

2 Social Policy and Fishery Sustainability

Social policies are also indispensable in the sustainable development of fisheries. Through reasonable fishery management regulations, social security and economic incentives, social policies can guide fishermen to adopt sustainable fishing methods and maintain the health of fishery resources. At the same time, social policies should focus on ensuring the livelihood of fishermen and the sustainable development of communities, ensuring that fishery activities not only meet short-term economic needs, but also take into account long-term ecological balance, and jointly promote fishery sustainability.

2.1 Evolution of fisheries management policies

The evolution of fisheries management policies is a process closely linked to social, technological and environmental changes. Initially, fisheries policy focused primarily on the development and utilization of resources to meet people's demand for seafood. However, with the awakening of overfishing and resource decline, policy gradually shifted towards a focus on sustainability. Since the mid-20th century, the international community has gradually recognized the dangers of overfishing, leading to the formulation of a series of international agreements aimed at limiting fishing activities and maintaining the health of resources (Viola et al., 2022).

With the continuous advancement of science and technology, fishery management policies have begun to rely on advanced scientific methods, such as satellite monitoring and ecological models, to more accurately assess the status of fishery resources (Figure 3). This provides a more objective basis for policy formulation and makes management measures more precise and targeted. At the same time, fishery management began to emphasize cooperation and cross-border coordination, because the mobility of fishery resources made it often difficult for a single country's management to be effective.



Figure 3 Fishermen using sea detection technology for fishing

In recent years, fisheries management policies have placed greater emphasis on participatory management and integrated ecosystem considerations. Community participation and co-management become key words, aiming to inspire local communities to be responsible for resources and have a sustainable vision. At the same time, management policies are gradually shifting toward maintaining the health of the entire marine ecosystem, emphasizing the importance of ecosystem stability for fishery sustainability. However, the evolution of fisheries management policy also faces several challenges. The impact of globalization has increased the transnational mobility of resources, requiring more effective international cooperation mechanisms. The issue of policy implementation is also an urgent challenge that needs to be solved, and relevant personnel need to strengthen supervision and law enforcement.

2.2 The impact of social policies on fishery practitioners

The impact of social policies on fishery practitioners is multifaceted. It not only plays an important role in the economic livelihood, career development and labor conditions of fishermen, but is also related to the sustainability and social equity of the entire fishery industry. Social policy plays a vital role in the livelihoods of those working in the fisheries industry. By providing welfare and social security systems, policies can provide fishermen with stable economic support and relieve livelihood pressure. For example, a reasonable social insurance system and medical benefits not only provide fishermen with a safety net during work, but also provide necessary protection when they retire, allowing fishery practitioners to engage in fishing activities with greater peace of mind.

In addition, social policy support for training and skills improvement directly affects the career development of fishery practitioners. By investing in fisheries training programs and technological innovation, policy can improve fishermen's skill levels and make them more responsive to market demands and changes in the fishery. This support not only helps to increase the income level of fishermen, but also promotes the modernization and sustainable development of the entire fishery industry. Social policy also plays a role in the labor conditions and safety of people working in the fishing industry. By formulating and enforcing labor regulations and safety standards, policies can ensure that fishermen receive reasonable remuneration and a good working environment at work, which not only helps safeguard the rights and interests of fishery practitioners, but also improves the social responsibility of the entire fishery industry.

However, the impact of social policy also faces some problems. On the one hand, some developing countries may not be able to provide sufficiently complete social policies due to economic pressure and other reasons, resulting in fishermen lacking necessary benefits and security. On the other hand, some countries may have problems with poor implementation of policies, making it difficult for fishermen to enjoy the rights and interests stipulated in the policies in practice. Therefore, policymakers should comprehensively consider the formulation and implementation of social policies to ensure that fishery practitioners can practice their profession in a safe, just, and sustainable environment and make positive contributions to the sustainable development of global fisheries.

2.3 The contribution of education, health and social security to fishery sustainability

Education, health and social protection contribute to fisheries sustainability. Education provides fishers with the necessary knowledge and skills to better understand the importance of management and conservation of fishery resources. By cultivating the environmental awareness and sustainable management concepts of fishery practitioners, education cultivates responsible and innovative practitioners for the future of the fishery industry.

Health is the cornerstone of fisheries sustainability. Good health enables fishermen to better adapt to the complex and changeable offshore working environment and improve work efficiency and safety. Through health education and medical protection, fishermen can better prevent and respond to potential health risks, reduce work interruptions caused by diseases, and thereby maintain the sustainable development of fisheries (Liu et al., 2023). The social security system provides fishermen with life security at different stages and enhances their stable investment in sustainable fisheries. Social security measures such as welfare security, pensions and medical insurance have improved fishermen's sense of social integration and made them more motivated to participate in sustainable fisheries management. Through social security, fishermen can receive financial support when facing retirement or emergencies, reducing their economic pressure and helping to maintain the stability of the fishing industry.

The combined contribution of these three areas provides a solid foundation for fisheries sustainability. Education not only enables fishermen to better understand scientific methods of fishing and protecting marine ecosystems, but also cultivates their ability to adapt to changes in an uncertain environment. Health and social security provide all-round support to fishermen from a broader social level, protect their basic rights and interests, and enable them to more actively participate in sustainable fishery practices. Of course, cultural and social background differences in different regions will also affect the implementation effects of these measures. Therefore, policymakers need to pay more attention to differences in different regions when formulating education, health and social security policies and provide targeted support to ensure that all fishermen can benefit.

3 Economic Development and Overfishing

As the global economy continues to grow, society's demand for seafood has increased significantly, driving the expansion of fishing activities. However, this expansion is often accompanied by overfishing (Figure 4), becoming a contributing factor to the decline of fishery resources. Economic development has triggered a huge demand for fishery products, driving the rapid growth of overfishing. Fisheries have become an important economic pillar in many countries and regions, and the market demand for fishery products continues to rise. In order to cater to market demand, fishermen have adopted more efficient but irresponsible fishing methods, such as large trawls and gillnets, to quickly increase production while ignoring the sustainability of the resource.

Although economic development has led to the continuous advancement of fishery technology, it has also intensified the over-exploitation of resources. Advanced fishing gear and technology have made fishing more efficient, but they have also brought great pressure on marine ecosystems. Fishing levels that exceed the natural recovery capacity have led to over-exploitation of resources. Some important commercial fish species such as cod and tuna have suffered tremendous pressure, and fishery resources continue to decline (Pereira et al., 2023). Economic development has promoted the globalization of international fisheries and intensified competition and pressure on resources. The interconnectedness of global fisheries markets has led some countries to adopt overfishing strategies in order to remain competitive, ignoring the natural renewal cycle of resources. This global

competition has led to the transnational loss of resources and uneven development, making fishery resources in some areas more vulnerable to decline.



Figure 4 Overfishing in fishing activities

Driven by economic development, governments often pay more attention to the economic contribution of fisheries and ignore the sustainability of resources. Fisheries are seen as a means to stimulate economic growth, and policies are often more inclined to provide short-term economic benefits without considering the long-term health of the resource. This resulted in short-sighted management decisions that accelerated resource decline. The growth of market demand, technological progress, global competition and short-sighted government policies are all intertwined and jointly promote overfishing and over-exploitation of resources. In order to achieve sustainable fisheries, a balance must be found between economic development and resource protection. Through scientific management, international cooperation and sustainable development policies, we must ensure that fishery resources can be used sustainably while developing the economy.

4 Discussion on Sustainable Development Model

Discussion of the sustainable development model of fisheries requires finding a suitable balance in marine resource management, economic interest balance and social justice. This challenge requires careful thinking to ensure that fishing activities maintain economic prosperity while protecting the sustainability of the marine environment. In terms of scientific management of marine resources, it is necessary to rely on modern technology for monitoring and assessment of fishery resources. By implementing fishery quotas and managing fishing seasons, overfishing and resource depletion can be avoided, giving marine ecosystems time to repair and regenerate themselves.

Sustainable development of fisheries also requires establishing a balance between economic benefits and resource protection. Market mechanisms, pricing and trade policy development will play a key role in motivating fishermen to use resources responsibly. Promote the development of fisheries in a more sustainable and high value-added direction, such as developing eco-friendly fishing gear and promoting fishery certification systems, to achieve long-term and healthy development of the fishery economy. The key to connecting economy and ecology lies in ecological compensation and resource protection measures (Chen et al., 2022). Establish an ecological compensation mechanism to reward fishermen who have made efforts in resource protection and encourage them to adopt more environmentally friendly and sustainable fishing methods. At the same time, establishing no-fishing zones and fishery reserves to protect important breeding and habitats will help maintain the balance of marine ecology.

At the social level, the sustainable development model should pay attention to the livelihood and social justice of fishery workers. By providing training and skills transformation, fishermen can gradually transition to a

sustainable fishing model to reduce excessive pressure on traditional fishery resources. In addition, a social security mechanism should be established to ensure that fishery employees are not under too much economic pressure during the transformation process and promote the smooth transformation of society. When discussing the sustainable development model of fisheries, it is necessary to recognize the complexity and diversity of the interests of all parties. Therefore, a multi-party cooperation mechanism is established, including the coordinated operations of governments, fishery companies, non-governmental organizations, scientific research institutions and other forces to jointly promote the realization of the concept of sustainable development. The government should establish a sound system of policies and regulations, clarify the property rights and use rights of fishery resources, and guide the fishery towards a path of sustainable development.

The construction of a sustainable fishery development model requires integrated thinking and collaborative cooperation. In practice, relevant personnel should focus on interdisciplinary research and comprehensive policy formulation. Through technological innovation, social participation and global cooperation, the goal of sustainable development of fisheries can be achieved, the sustainable utilization of marine resources can be guaranteed, the health of the fishery economy can be maintained, and the overall progress of society can be promoted. This comprehensive discussion and practice will help establish a more balanced and sustainable fishery model and create beneficial conditions for the future prosperity of the ocean and humans.

5 Summary and Outlook

In the current discussion of sustainable development of fisheries, researchers face many challenges and opportunities. The over-exploitation of fishery resources, the conflict between economic interests and ecological balance, social justice and the livelihood issues of fishery practitioners constitute important issues for current sustainable development. In order to solve these challenges, researchers need to comprehensively consider multiple factors such as scientific management, economic incentives, ecological compensation and social security to build a more healthy, balanced and sustainable fishery model.

Future research directions should focus on deeply exploring the mutual influences at all levels in the fishery sustainable development model, thereby establishing a more systematic and comprehensive theoretical framework. In terms of scientific management, they need to further improve the scientific and technological level of fishery resource monitoring and assessment, and promote the effective management of fishery quotas and fishing seasons. Research at the economic level can explore more flexible price mechanisms and trade policies that are conducive to sustainable development. At the same time, we will conduct in-depth research on social-level issues, including how to promote skills training for fishermen, achieve comprehensive coverage of social security, and achieve social justice in the transformation of the fishery industry.

The deepening of this research direction will help everyone understand the overall issues of sustainable development of fisheries and find more effective solutions. In this process, all parties need to focus on multi-party cooperation and encourage the joint participation of governments, enterprises, scientific research institutions and social organizations. Establish a platform for interdisciplinary and cross-border cooperation to form a more powerful force for sustainable development by sharing data, experience and resources. Future research also needs to focus on global issues, especially the impact of climate change on the sustainable development of fisheries. Issues such as rising ocean temperatures and acidification caused by climate change have had a major impact on the distribution and quantity of fishery resources.

The sustainable development of fisheries is not only a problem in a single field, but also a complex system of global ecological and economic interactions. It is related to the livelihood of thousands of families and the balance of the earth's ecosystem (Yarkina and Logunova, 2021). In-depth research on the sustainable development of fisheries is not only to ensure the livelihood of fishery practitioners and the health of the fishery economy, but also to protect the marine ecosystem and maintain global ecological balance. All in all, the current challenges faced by the sustainable development of fisheries require researchers to seek systematic solutions, in-depth multi-level and all-round analysis, and promote the coordinated development of fishery science, economy and society.

References

- Chen Q., Luo H., and Zhao Y.F., 2022, Developing ecological aquaculture to promote sustainable development of large surface fisheries, *Kexue Yangyu (Scientific Fish Farming)*, 44(1): 20-23.
- Froese R, Zeller D., Kleisner K., and Pauly D., 2023, Worrysome trends in global stock status continue unabated: a response to a comment by R.M. Cook on 'What catch data can tell us about the status of global fisheries', *International Journal on Life in Oceans and Coastal Waters*, 160(9): 2531-2533.
<https://doi.org/10.1007/s00227-013-2185-9>
- James M.A., Gozzer R.W., Mendo T., Gomez I., Grillo J.N., and Mendo J., 2023, To ignore or mitigate - Economic implications of an illegal artisanal trawl fishery in northern Peru, *Marine Policy*, 158: 105865.
<https://doi.org/10.1016/j.marpol.2023.105865>
- Liu H.H., Peng D.M., Yang H.J., Mu Y.T., and Zhu Y.G., 2023, Exploring the evolution of sustainable fisheries development: Focusing on ecological, environmental and management issue, *Ecological Informatics*, 75.
<https://doi.org/10.1016/j.ecoinf.2023.102004>
- Liu X.C., 2023, Analysis on the current situation and countermeasures of fishery economy development, *Zhongguo Shichang (China Market)*, (8): 43-45.
- Lu Q., Fang Z., and Chen X.J., 2021, Evaluation of sustainable utilization of fishery resources in the Indian Ocean based on grey relational analysis, *Guangdong Haiyang Daxue Xuebao (Journal of Guangdong Ocean University)*, 41(5): 61-66.
- Pereira D.V. Mereles M.D.A., Matos O.F.D., Lopes G.C.D.S., Conceição K.G.D., and Freitas C.E.D.C., 2023, Vulnerability to overfishing of fish stocks in the Amazon Basin, *Fisheries Research*, 265.
<https://doi.org/10.1016/j.fishres.2023.106740>
- Rashid U.S., Charlotte F.D., and Lourdes D.M.P., 2023, Editorial: How overfishing handicaps resilience of marine resources under climate change, *Frontiers in Marine Science*, 10.
<https://doi.org/10.3389/fmars.2023.1250449>
- Viola A., Giovanni R., and Matthias W., 2022, Exploration of fisheries management policies in the Gulf of Nicoya (Costa Rica) using ecosystem modelling, *Ocean Coast. Manage.*, 230.
<https://doi.org/10.1016/j.ocecoaman.2022.106349>
- Wang Q., 2023, Fishery resource management and protection strategies, *Shipinjie (Food Industry)*, 4: 107-109.
- Yarkina N., and Logunova N., 2021, The concept "blue growth" as a way for sustainable development of the fisheries, *E3S Web of Conferences*, 244: 3021.
<https://doi.org/10.1051/e3sconf/202124403021>
- Zhu M.H., and Qian W.G., 2022, Reasons for the decline of fishery resources in Zhoushan Fishing Ground and its restoration strategies, *Nongcun Jingji yu Keji (Rural Economy and Science-Technology)*, 33(9): 79-82.