

Asset Management of Marine Resources and Sustainable Development and Utilization of Marine Resources

Norizan Diah *

Saadah University, Yemen

**corresponding author*

Keywords: Marine Resources Capitalization, Marine Resources, Sustainable Development, Asset Management

Abstract: Marine resources are the material basis for human survival. With the continuous growth of the world population and the rapid economic development, more and more attention is paid to the quality of the marine environment. China has a wide sea area, but the per capita level is low and the water resources are insufficient. In the process of development and utilization, excessive pursuit of profit maximization leads to serious waste of resources. At the same time, due to the lack of unified planning and management, the disadvantages of high development intensity but less sustainable use are increasingly prominent and the situation is increasingly severe. Therefore, strengthening the reasonable and effective investment and construction of marine resources is an inevitable choice to achieve the harmonious coexistence and common development of human and nature and improve the quality of ecological environment. This paper first introduces the asset management of marine resources, then expounds the methods of sustainable development of marine resources, and then surveys the people's cognition of the concept of sustainable development of marine resources by means of questionnaires. The survey results show that most people are very supportive of the sustainable development of marine resources, and a small number of people do not understand this concept.

1. Introduction

Marine resources are the basis for human survival. With the accelerated process of world economic globalization and regional integration and the accelerating pace of industrialization and urbanization in China, the marine industry is developing rapidly [1-2]. However, in recent years, due to sea disasters, water and soil problems, there have been varying degrees of damage. In particular, the serious damage caused by pollution in coastal areas is even worse. The serious destruction of marine organisms has led to the reduction and even extinction of their populations,

which makes people gradually realize the necessity and urgency of developing marine resources and start to work on how to effectively use limited freshwater resources to save the ecological environment and economic development [3-4].

The sustainable development and utilization of marine resources has been paid enough attention by domestic scholars and relevant government departments. They have studied the resource management of sustainable development from different perspectives. After a detailed analysis of China's coastal areas, some scholars believe that land and sea strategic mineral exploration is a long-term project. Its purpose is to provide scientific basis for planning decision makers [5-6]. The feasibility and economic benefits of marine development will be realized through geological survey and database establishment, and the results will be fed back to relevant departments, so as to make corresponding measures adjustment and improvement plans to cope with the complex and changeable market environment changes. Some scholars believe that China's sustainable ecological construction is backward, and to achieve sustainable development, we need to improve the ecological environment governance system. Ecosystem health can be measured by biodiversity and environmental pollution, and human activities will also affect the survival and utilization of marine organisms and their quantity change trend [7-8]. Therefore, this paper studies the asset management of marine resources to realize the sustainable development and utilization of marine resources.

With the influence of global warming, water shortage and other factors, people's quality of life gradually decreases and the awareness of environmental protection continues to improve. How to realize the rational development and management of marine resources has become a topic of common concern to all countries. This paper focuses on the specific research and analysis of marine key protected areas, discusses the current situation and existing problems of marine ecological sustainable development, and puts forward countermeasures and suggestions.

2. Discussion on Asset Management of Marine Resources and Sustainable Development and Utilization of Marine Resources

2.1. Asset Management of Marine Resources

The asset management of marine resources refers to the comprehensive planning and control of the resources that have been used or developed by enterprises and can directly bring economic benefits and social values to the society and achieve their utilization purposes [9-10]. Its purpose is to maximize the economic benefits and social values that will not be produced under limited mining into sustainable development. The asset management of marine resources has the characteristics of long-term and dynamic. The traditional administrative organization interferes too much in the internal operation mechanism of the enterprise, resulting in low decision-making efficiency and lack of scientific planning. The modern market competition is more intense, complex and changeable, which makes the strategic alliance increasingly close and forms a new point of interest conflict. Specifically, it means to confirm the physical form of seafood and natural resources within the scope of national laws and regulations by certain means and then put them into commercial production and operation. The asset management of marine resources can make the resource owners realize that there are huge business opportunities, economic benefits and social values in the development and utilization of marine resources. The core of transforming the traditional "heavy mining" into sustainable development lies in the reorganization and allocation of existing assets and the rational use through scientific planning, so as to maximize the extension of the industrial chain and increase the variety of products. At the same time, the investment in the application of new technologies is increased to improve economic efficiency, so as to obtain greater market profits and social value. Fig. 1 is the flow chart of asset management of marine resources [11-12].

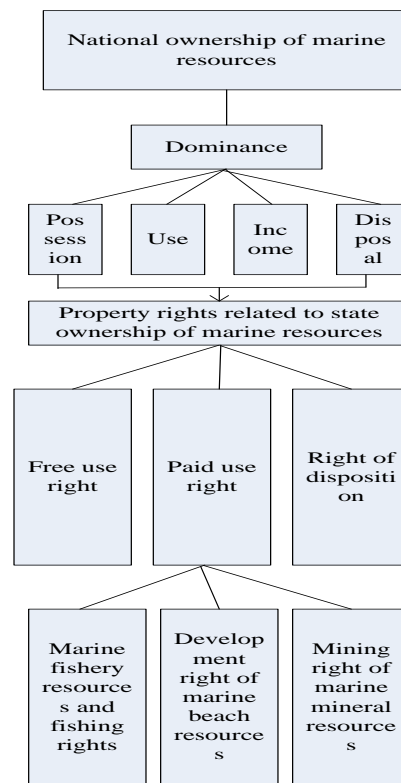


Figure 1. Marine resources asset management process

2.2. Importance of Sustainable Development of Marine Resources

Since ancient times, people have paid different attention to natural resources and environmental issues, especially now. The development of marine resources is to meet the needs of people's material and cultural life, and the problems in the marine area are increasingly serious. For example, sea water pollution, the sharp reduction of marine biodiversity, a series of environmental and economic conflicts such as the aggravation of freshwater shortage caused by overfishing, ecological destruction, and the deterioration of the ecological environment caused by the lag of a large number of seafood all pose threats and challenges to human survival and development. Therefore, we must have a long-term strategic vision [13-14]. Figure 2 shows the causal relationship of marine resource pollution.

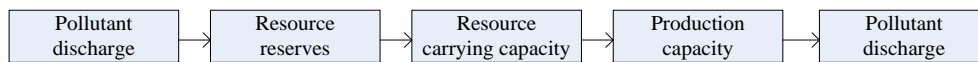


Figure 2. Causal and effect relationship of Marine resource pollution

We must clearly understand that if we do not control, blindly develop the earth's resources, or ignore the disasters caused by the ecological environment, irrecoverable pollution will seriously threaten the security of the ecosystem. It will be unimaginable and difficult to save a series of ecological consequences caused by any person's excessive use of natural resources without control and protection. The sustainable development of marine resources is an inevitable problem to be solved in the process of establishing harmonious coexistence and common progress between mankind and nature. Globally, the United States, in particular, has put forward slogans such as "post colonialism" and "sustainable development". Sustainable development is an important issue facing the current human society. The development and utilization of marine resources has also become a very prominent and urgent strategic problem in China's economic development. With a large

number of environmental pollution phenomena in the investment and construction activities of countries around the world, the destruction of marine biodiversity and the loss of huge wealth caused by overfishing, on the other hand, the expansion of the scale of marine industry and the backward processing technology have caused serious waste of resources, resulting in the deterioration of the marine ecological environment and affecting the balance of social economic benefits and ecological values. Sustainable development is an important theme of the present and future society, which emphasizes the mutual coordination and promotion between resource utilization and environmental protection [15-16].

2.3. Sustainable Development Curve

The capitalization of marine resources for sustainable development and utilization is a development trend. In the future, with the rapid growth of social economy, science and technology and the continuous improvement of human living standards. The reserves of renewable natural resources have increased rapidly. All countries in the world are facing environmental problems caused by the huge consumption of non renewable energy such as oil and natural gas (especially in Africa). China has also gradually strengthened the protection of marine living resources and incorporated them into key plans for strict control and management. The self-organization theory believes that an open system must form an ordered structure, and its internal interaction must be nonlinear. Therefore, the mathematical model described by the nonlinear differential equation is the characteristic of the self-organization theory. Logistic equation is its most general form, which is often used to describe the evolution process of general development system, also known as growth curve model [17-18]. The development process of the system is represented by $X(T)$, then the system development speed is DX / DT , and the relative development speed is DT / DX , $1 / X$. Since the development of marine resources is subject to the constraints of environment, resource carrying capacity, resource development investment and other factors, in the process of marine resources development, the role of limiting factors will gradually become prominent, and the speed of system development will slow down. Here, the relative development speed is a linear decreasing function of X , that is

$$\frac{1}{X} \frac{dX}{dt} = r - \frac{r}{K} X \quad (1)$$

The differential equation of logistic curve is:

$$\frac{dX}{dt} = r * X \left(1 - \frac{X}{K} \right) \quad (2)$$

Where R represents the maximum relative development speed of the system promoted by the limiting factor; K represents the maximum development level of the system that can be promoted by the limiting factor, and $x_{max} = K$.

3. Experimental Process of Asset Management of Marine Resources and Sustainable Development and Utilization of Marine Resources

3.1. Methods for Sustainable Development and Utilization of Marine Resources

Marine natural resources include land, sea floor and underground organisms, of which marine organisms are the main constituent. China's sea area is vast and diverse. A large number of fish and shellfish are distributed on the land, and they also have many unique advantages in fishery.

Secondly, there are abundant and numerous non renewable resources such as oil and natural gas, and fresh fruits and vegetables produced by fresh water, which have a wide range of food sources and high nutritional value. Furthermore, marine natural resources include marine products, seabed and sea water. For the sustainable development and utilization of marine resources, it is necessary to fully understand and analyze its potential value, and formulate reasonable and effective plans through investigation, research, prediction and evaluation of market and consumer demand and product sales. As shown in Fig. 3, it is sold to users after exploration, exploitation, production and processing of the sea area. Therefore, the differences of development and utilization objectives and conflicts of interests among different regions and departments should be fully considered in this process. Establish and improve the management system under the guidance of sustainable development strategy. Improve the level of seawater desalination process by means of resource renewable exploitation technology to extend the production cycle, strengthen cooperation among enterprises to maximize the economic benefits of scale, encourage industrial integration and enhance the advantages of marine human resources to develop and utilize the marine underground reserves, and promote the construction of a long-term mechanism for the recycling and utilization of marine biological resources in China.

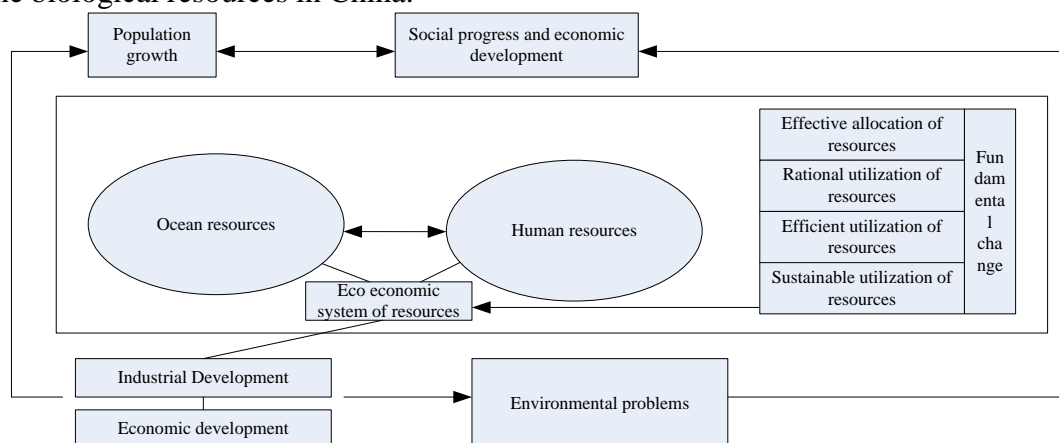


Figure 3. Sustainable development and utilization process of Marine resources

3.2. Cognitive Investigation on Sustainable Development of Marine Resources

The sustainable development and utilization of marine resources is to promote the development of marine economy and social stability, improve the quality and level of the environment, achieve the goal of environment-friendly living, and promote the transformation of human healthy lifestyle. At present, China is in the stage of structural adjustment in the middle of industrialization. Industrial transformation and upgrading is imperative, while marine engineering, as a major energy consumer, is facing increasingly prominent and severe challenges such as "high pollution and low output". The sustainable development and utilization of marine resources is not only the development strategy and policy orientation of marine industry, but also one of the most effective means that have the greatest impact on human life and socio-economic activities and optimize the way to achieve it. Therefore, we should strengthen publicity and education. In China's coastal areas, it is necessary to carry out a series of measures such as the popularization of knowledge on sustainable development and use and the training of relevant laws and regulations to improve people's awareness of marine biodiversity protection. At the same time, it is necessary to carry out the survey of marine cultural resources and marine natural resources through the network platform to provide basic data support, decision-making reference and technical support for marine ecosystem assessment and policy formulation.

4. Investigation and Analysis on Asset Management of Marine Resources and Sustainable Development and Utilization of Marine Resources

4.1. Investigation and Analysis on Public Cognition of Sustainable Development of Marine Resources

Table 1 shows the cognition of the randomly selected people on the concept of sustainable development of marine resources.

Table 1. The cognition situation of the sustainable development concept of Marine resources

Survey crowd	Support	Nonsupport	Dimness
Children	68%	12%	20%
Youngsters	95%	1%	4%
Wrinkly	93%	2%	5%
Old people	79%	10%	11%

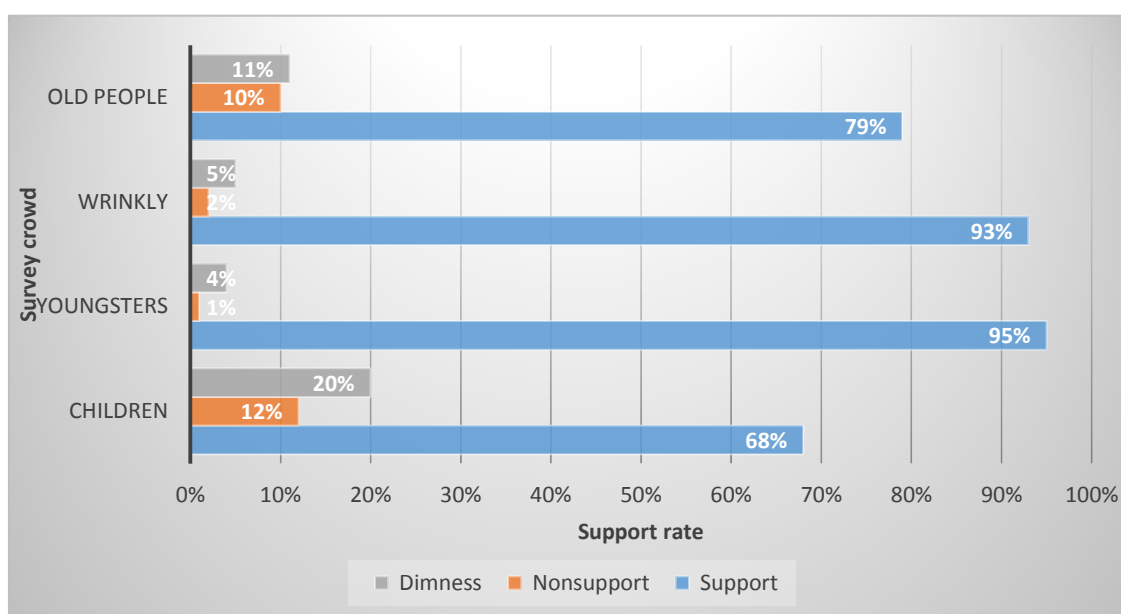


Figure 4. Cognitive survey

The sustainable development and utilization of marine resources is an indispensable part of the long-term development of the ocean, and the understanding of it will help us to understand this concept more deeply. Through the questionnaire survey, it is found that there are some problems in the management of marine environment: first, re mining and light protection; second, attaching importance to immediate interests and ignoring long-term benefits. The current sea area used and the possible change or potential damage in the future are analyzed and corresponding measures are taken to prevent and treat or save the resources that do not need to spend too much energy can be developed to make up for the shortage and loss of existing resources. It can be seen from Figure 4 that most people support the sustainable development of marine resources, and a small number of people do not understand this concept.

5. Conclusion

Marine resources are the basis of human survival and development. Sustainable development and

utilization can not only solve the current environmental pollution problem, but also make scientific and rational use of natural resources and make full use of water bodies. Therefore, it is imperative for China to vigorously promote the reform of marine resource management system. This paper analyzes the comprehensive management and planning of sea area under the background of sea land air integration. Based on the actual situation and local conditions, formulate a strategic plan for marine ecological restoration that conforms to China's national conditions, explore measures and suggestions on how to achieve a sustainable development model and promote coordinated economic and social development.

Funding

This article is not supported by any foundation.

Data Availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

Conflict of Interest

The author states that this article has no conflict of interest.

Reference

- [1] Mohammed Arshad Khan, Mohd Shuaib Siddiqui, Mohammad Khalid Imam Rahmani, Shahid Husain: *Investigation of Big Data Analytics for Sustainable Smart City Development: An Emerging Country*. *IEEE Access* 10: 16028-16036 (2022). <https://doi.org/10.1109/ACCESS.2021.3115987>
- [2] Amandeep S. Gill, Stefan Germann: *Conceptual and normative approaches to AI governance for a global digital ecosystem supportive of the UN Sustainable Development Goals (SDGs)*. *AI Ethics* 2(2): 293-301 (2022). <https://doi.org/10.1007/s43681-021-00058-z>
- [3] Siddhant Jain, Shashank Gupta, K. K. Sreelakshmi, Joel J. P. C. Rodrigues: *Fog computing in enabling 5G-driven emerging technologies for development of sustainable smart city infrastructures*. *Clust. Comput.* 25(2): 1111-1154 (2022). <https://doi.org/10.1007/s10586-021-03496-w>
- [4] Alexander Eboror, Nivedita Agarwal, Alexander Brem: *Fostering the Sustainable Development Goals with technologies underpinned by frugal innovation*. *Int. J. Technol. Manag.* 88(2/3/4): 155-174 (2022). <https://doi.org/10.1504/IJTM.2022.121503>
- [5] Cosku Can Orhan, Mario Guajardo: *Analytics in developing countries: methods, applications, and the impact on the UN Sustainable Development Goals*. *Int. Trans. Oper. Res.* 29(4): 2041-2081 (2022). <https://doi.org/10.1111/itor.13018>
- [6] Coral Calero, Mar  a  ngeles Moraga, F  lix Garc  a: *Software, Sustainability, and UN Sustainable Development Goals*. *IT Prof.* 24(1): 41-48 (2022). <https://doi.org/10.1109/MITP.2021.3117344>
- [7] K. Karunanithi, S. P. Raja, S. Ramesh, K. Karthikumar, P. Chandrasekar, K. Aruna Rani: *Investigations on Off-Grid Hybrid Renewable Energy Microgrid for Sustainable Development Growth*. *J. Circuits Syst. Comput.* 31(6): 2230003:1-2230003:21 (2022). <https://doi.org/10.1142/S0218126622300033>
- [8] Sumaiya Benta Nasir, Tazim Ahmed, Chitra Lekha Karmaker, Syed Mithun Ali, Sanjoy Kumar

- Paul, Abhijit Majumdar: Supply chain viability in the context of COVID-19 pandemic in small and medium-sized enterprises: implications for sustainable development goals. *J. Enterp. Inf. Manag.* 35(1): 100-124 (2022). <https://doi.org/10.1108/JEIM-02-2021-0091>
- [9] Avik Sinha, Arnab Adhikari, Ashish Kumar Jha: Innovational duality and sustainable development: finding optima amidst socio-ecological policy trade-off in post-COVID-19 era. *J. Enterp. Inf. Manag.* 35(1): 295-320 (2022). <https://doi.org/10.1108/JEIM-06-2021-0278>
- [10] Malin Song, Chenbin Zheng, Jiangquan Wang: The role of digital economy in China's sustainable development in a post-pandemic environment. *J. Enterp. Inf. Manag.* 35(1): 58-77 (2022). <https://doi.org/10.1108/JEIM-03-2021-0153>
- [11] Mohammed Hamdi: Towards a classification of sustainable software development process using manifold machine learning techniques. *J. Intell. Fuzzy Syst.* 42(6): 6183-6194 (2022). <https://doi.org/10.3233/JIFS-212600>
- [12] Omorodion Okuonghae, Edwin Iroroeavwo Achugbue: Digital librarianship practice and open access technology use for sustainable development in Nigeria. *Digit. Libr. Perspect.* 38(3): 318-331 (2022). <https://doi.org/10.1108/DLP-01-2021-0007>
- [13] Vincent Mai, Bram Vanderborght, Tamás Haidegger, Alaa M. Khamis, Niraj Bhargava, Dominik B. O. Boesl, Katleen Gabriels, An Jacobs, AJung Moon, Robin R. Murphy, Yasushi Nakauchi, Edson Prestes, Bhavani Rao R., Ricardo Vinuesa, Carl-Maria Mörch: The Role of Robotics in Achieving the United Nations Sustainable Development Goals - The Experts' Meeting at the 2021 IEEE/RSJ IROS Workshop [Industry Activities]. *IEEE Robotics Autom. Mag.* 29(1): 92-107 (2022). <https://doi.org/10.1109/MRA.2022.3143409>
- [14] Tolga Bakirman, Mustafa Umit Gumusay, Nebiye Musaoglu, Aysegul Tanik: Development of sustainable wetland management strategies by using the analytical hierarchy process and web-based GIS: A case study from Turkey. *Trans. GIS* 26(3): 1589-1608 (2022). <https://doi.org/10.1111/tgis.12875>
- [15] Ascensión López-Vargas, Agapito Ledezma, Jack Bott, Araceli Sanchis: IoT for Global Development to Achieve the United Nations Sustainable Development Goals: The New Scenario After the COVID-19 Pandemic. *IEEE Access* 9: 124711-124726 (2021). <https://doi.org/10.1109/ACCESS.2021.3109338>
- [16] Khadija Parvin, Molla S. Hossain Lipu, M. A. Hannan, Majid Abdullateef Abdullah, Pin Jern Ker, R. A. Begum, Muhamad Mansur, Kashem M. Muttaqi, Teuku Meurah Indra Mahlia, Zhao Yang Dong: Intelligent Controllers and Optimization Algorithms for Building Energy Management Towards Achieving Sustainable Development: Challenges and Prospects. *IEEE Access* 9: 41577-41602 (2021). <https://doi.org/10.1109/ACCESS.2021.3065087>
- [17] Sita Rani, Ram Krishn Mishra, Mohammed Usman, Aman Kataria, Pramod Kumar, Pankaj Bhabri, Amit Kumar Mishra: Amalgamation of Advanced Technologies for Sustainable Development of Smart City Environment: A Review. *IEEE Access* 9: 150060-150087 (2021). <https://doi.org/10.1109/ACCESS.2021.3125527>
- [18] Valerie Onyia, Emmanuel C. Ogu: Cognizant computing + transformative marketing: an intelligent solution for sustainable business development. *Bus. Process. Manag. J.* 27(6): 1926-1934 (2021). <https://doi.org/10.1108/BPMJ-10-2021-595>