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Environmental Economic Profit and Loss Analysis in Environmental Assessment of Offshore Oil and Gas Improvement

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Abstract: With the increase of society's demand for energy, the improvement of oil and gas resources has accelerated, and the environmental problems caused by it have become more and more prominent. Oil and gas improvement is a systematic project with a long duration and complex skills. The environmental problems it causes are bound to be complex and diverse. The research purpose of this paper is the application of environmental and economic profit and loss analysis in the environmental impact assessment of offshore oil and gas improvement. In the experiment, taking M city as the research object, an evaluation system was established to investigate and analyze the impact of offshore oil and gas improvement on marine engineering ecology and the analysis of spatial changes in ecological environment and economic damage. The experimental results show that the environmental damage of the sea area affects the economic improvement of the aquatic industry. The economic improvement of the aquatic industry in M city is worse as the ecological environment is damaged, and the industrial economic improvement is worse.

1. Introduction

In recent years, with the prominence of the international energy shortage, my country has stepped up its offshore oil and gas exploration and improvement activities. Several oil and gas improvement projects have been put into production. Offshore oil and gas improvement projects are a type of marine engineering. There are relatively few applied researches on EIA for engineering oil and gas improvement, so it is of great significance to carry out its research [1].

Oil and gas resources are important strategic materials necessary for national and social improvement. Petroleum is one of the most important energy materials in the world today, and it is of great significance to industrial and economic improvement. Evdoschuk M I's research relevance

is supported by the need to expand the resource potential of some fields in the Baku Islands. The purpose of the study is to determine tectonic evolution characteristics, paleogeography, pressure and temperature conditions, and deposition rates to assess the hydrocarbon prospects of the survey area. The paleo-structural and paleo-geographical reconstruction of the survey area was carried out using computer software, and the structural model of the sedimentary belt was constructed according to the paleo-geographic data. Historical studies of geological evolution show that they share common sedimentary characteristics, and the paleogeographic conditions and deposition rates of some stratigraphic units have contributed to the accumulation of rock organic matter in sections above Clark number; The pressure and temperature conditions under which oil and gas are produced are very favorable [2]. Ch.N. Stefanakos a studies how global climate change could have severe impacts on human activities in coastal and other areas. Climate change may affect the magnitude of storms, thereby altering the wind-driven wave climate. This can affect the risks associated with maritime activities such as shipping and offshore oil and gas. Therefore, it is recognized that a better understanding of how climate change will affect these processes is needed. Often, this understanding comes from numerical climate model predictions of future wind and wave climates and stochastic modeling of such predictions. This work investigates the applicability of recently proposed non-stationary fuzzy modeling to wind-wave climate simulations [3]. Since the founding of the People's Republic of China, my country's oil industry has improveed rapidly, major oil fields have been continuously discovered, and crude oil production has continued to increase. Oil field improvement has improved into a pillar industry of my country's economic improvement.

Through the overview of environmental and economic profit and loss analysis, this paper studies its meaning and the steps of environmental and economic profit and loss analysis. At the same time, it analyzes the economics and influencing factors of the oil and gas improvement stage, as well as the application of environmental and economic profit and loss analysis in the environmental impact assessment of offshore oil and gas improvement, including The connotation of EIA for planning, the relationship between EIA for planning and EIA for oil and gas improvement and construction projects, and the characteristics of environmental and economic profit and loss analysis in EIA for planning. In the experiment, taking M city as the research object, an evaluation system was established to investigate and analyze the impact of offshore oil and gas improvement on marine engineering ecology and the analysis of spatial changes in ecological environment and economic damage.

2. Research on the Application of Environmental Economic Profit and Loss Analysis in Environmental Assessment of Offshore Oil and Gas Improvement

2.1. Overview of Environmental and Economic Profit and Loss Analysis

(1) Meaning

Regarding the meaning of the economic profit and loss analysis of environmental impact, there is no generally accepted statement, and its complete concept is still being explored [4-5]. Here we believe that the economic profit and loss analysis of environmental impact, that is, the economic evaluation of environmental impact, is to use scientific and feasible evaluation methods to realize the monetization of environmental changes caused by the construction and operation of the project, and incorporate the value of the monetization into the project's value. Economic analysis goes in to judge the feasibility of the project implementation. The US government has stipulated that all projects or improvement plans and major decisions that have an impact on the environment should carry out economic evaluation of environmental impact, as an important basis for evaluating whether the project is feasible [6-7]. Therefore, we can determine that as long as it is a link that has

an impact on the environment, economic evaluation of environmental impact or environmental and economic profit and loss analysis can be carried out to provide technical support for decision-making, so as to achieve as much as possible while social and economic improvement. The purpose of reducing or avoiding environmental impact.

(2) Environmental and economic profit and loss analysis steps

The economic profit and loss analysis of environmental impact can usually be divided into the following steps in theory: first we need to screen the environmental impact of the project; then we need to do the work of quantifying the environmental impact of the project; then carry out the value assessment of the environmental impact; finally, the assessment results are included in the Economic analysis of the project and determine its feasibility [8]. The specific procedure is shown in Figure 1:

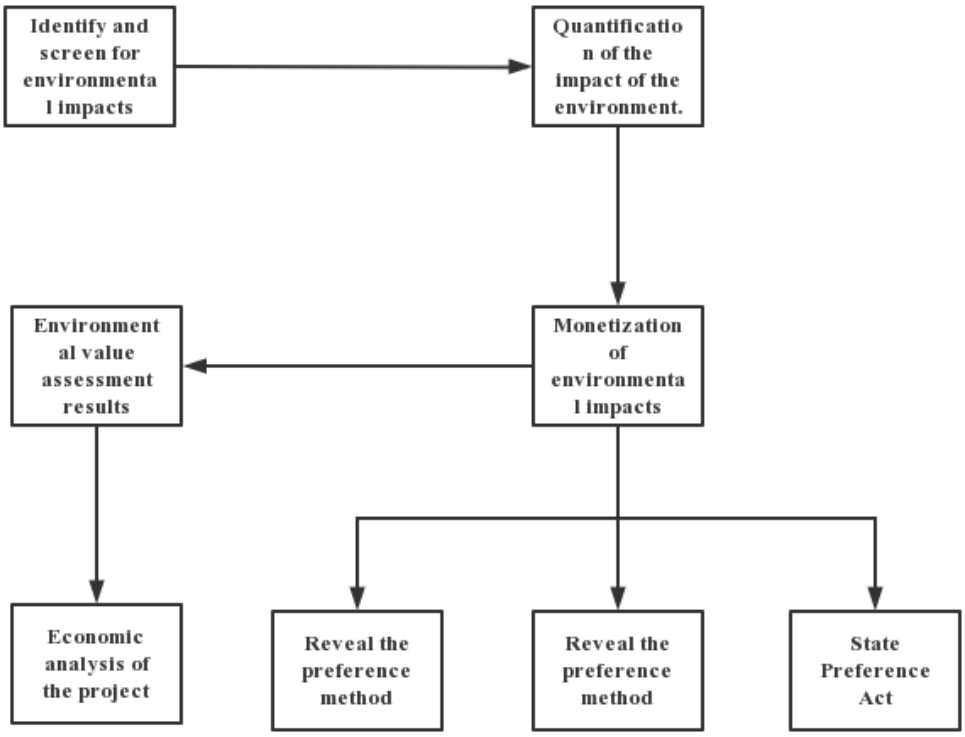

Figure 1. The steps of the environmental economic cost-benefit analysis theory

2.2. Analysis of Economy and Influencing Factors in Oil and Gas Improvement Stage

In the production capacity construction stage of oil and gas improvement, its main tasks are the investment and construction of new oil and gas production capacity and surface supporting projects, as well as the maintenance and reconstruction of large investment in old oilfields, so as to ensure the increase of reserves and production and slow down the production capacity decline of old oilfields[9]. Its economy is mainly to obtain large oil and gas production capacity with lower investment through investment and construction, to ensure basic investment returns during the investment life and to strive for maximum investment benefits. The basis is to slow down the decline in oil and gas production and balance the relationship between current and long-term economic interests [10]. The construction of oil and gas improvement capacity is the guarantee for the survival, improvement and profitability of oilfield companies. In particular, continuous

investment in old oilfields is required to slow down production decline and long-term stable and effective improvement. Constant investment is required for equipment maintenance, adjustment of production and asset structure, Expand reproduction, etc., to ensure that enterprises enhance their own capabilities, improve competitiveness and sustainable improvement. At the same time, we should recognize the lagging characteristics and periodicity of investment benefits or effects in the petroleum industry, and we need to examine the benefits and output effects from the scope of the investment life cycle as a whole; and demonstrate and evaluate the investment decision period, investment implementation period, and investment payback period. . Characteristics of Economic Evaluation of Oilfield Improvement Projects Oilfield improvement is a high-tech, high-investment and high-risk engineering project. With the deepening of improvement, the difficulty of oil and gas resource extraction and production costs will also increase [11].

2.3. Application of Environmental Economic Profit and Loss Analysis in EIA of Offshore Oil and Gas Improvement

(1) The connotation of planning EIA

Strategic environmental assessment is the application of environmental impact assessment at the level of strategic regulations, policies, plans and plans is the process of systematically and comprehensively evaluating the environmental impacts of policies, plans and plans and their alternatives [12].

(2) The relationship between the planning EIA and the EIA of oil and gas improvement and construction projects

Planning EIA and project EIA are two components of impact assessment for the entire improvement activities, and they are impact analysis means corresponding to each stage of the action plan. They have a common goal of achieving sustainable improvement [13]. Planning EIA is an important means to realize sustainable improvement strategy. It is to transform the implementation of sustainable improvement principles from abstract and objective strategies to actual planning EIA. It is usually regarded as the application of construction project EIA at the strategic level. However, planning EIA It is not the method of EIA for construction projects that is directly and simply transplanted from the project level to the strategic level, but the application of the principles of EIA for oil and gas improvement and construction projects at the strategic level [14]. Planning EIA is the product of the integration of construction project EIA and sustainability principles. Planning EIA provides the basis and framework for the relevant project EIA, which guides the relevant project EIA, and the relevant project EIA provides specific information and content for the planning EIA. It is the specificization and supplement of the planning EIA. deepening and improvement.

(3) The environmental and economic profit and loss analysis in the planning EIA has the following characteristics:

1. Dynamic variability

With the implementation of the plan, the ecological environment will continue to change, and changes in the industrial structure and productivity layout will have an impact on the environmental and economic profit and loss of planned marine engineering [15]. In addition, the exchange of matter and energy will also change with the implementation of the plan. Some impacts are direct, but some are indirect and irreversible. Especially when the impact on the environment accumulates to a certain extent, there will be Environmental load conditions.

2. Comprehensive

The bearing state of the environment is not only affected by the natural environment, but also includes many factors such as the technical improvement level, production capacity, and economic

level of marine engineering after the implementation of the planning scheme. It is a comprehensive environmental impact. In the analysis, it is necessary to take into account the unity so as to build a complete comprehensive environmental and economic profit and loss evaluation index system [16].

3. Regional

Regionality mainly means that the natural environment, economic status and social improvement status of different regions are not completely the same, and there are also differences in the occurrence of resources, especially the ecological environment, the number of population, the way of life, the mode of economic improvement and the amount of resources [17]. In addition, due to regional differences, the speed of economic improvement and the number of population will change at different levels after the implementation of the plan.

4. Objectivity

Under certain time and conditions, there is a certain comprehensive environmental carrying capacity value, through which the system can be adjusted, the environmental carrying capacity can be improved, and the marine engineering planning scheme can be optimized [18].

3. Investigation and Research of Environmental and Economic Profit and Loss Analysis in EIA of Offshore Engineering Oil and Gas Improvement

3.1. Research Content

This paper studies the impact of offshore oil and gas improvement on marine engineering ecology and the analysis of spatial changes in ecological environment and economic damage. The pollutants contained in the production water discharged from offshore oil and gas production are mainly petroleum substances, a small amount of suspended solids and organic substances (replaced by COD indicators). Survey and summary. Through the analysis of the ecological health of the sea area from 2018 to 2021, the economic improvement and improvement of the aquaculture industry in M city was analyzed.

3.2. Establishment of Evaluation System

According to the characteristics of the target sea area, referring to the comprehensive evaluation methods for the environmental quality of semi-closed bays at home and abroad, the ecological environment quality of the sea area is divided into water quality, sediment, biological ecology and fish biological quality. The composite index of each part is represented by A1, A2, A3 and A4 respectively. The ring quality composite index is represented by E. The larger the E value, the heavier the pollution degree.

$$E = W_1 A_1 + W_2 A_2 + W_3 A_3 + W_4 A_4 \tag{1}$$

In the formula: W_i is the weight of the i-th sub-indicator; A_i is the weight of the i-th sub-indicator

The scores for each sub-index are:

$$A = \beta_1 X_1 + \beta_2 X_2 + ... + \beta_n X_n \tag{2}$$

In the formula: β_n is the weight of each index X_n under the sub-index; X_n is the value of each index of the sub-index.

4. Application and Analysis of Environmental Economic Profit and Loss Analysis in Environmental Assessment of Offshore Oil and Gas Improvement

4.1. Influence of Offshore Oil and Gas Improvement on Marine Engineering Ecology

The pollutants contained in the production water discharged from offshore oil and gas production are mainly petroleum substances, a small amount of suspended solids and organic substances (replaced by COD indicators), and the total discharge of these three pollutants accounts for 94% of the total pollutant discharge. % or more, of which the emission of petroleum substances is the largest. According to the data from 2018 to 2021 of the M City Oilfield, the emissions of petroleum-based substances far exceed those of organic substances. Therefore, the transformation mechanism of petroleum-based substances can reveal how the marine environment is damaged.

Table 1. Discharge situation of oilfield pollutants

Time	Petroleum category (ton / year)	COD (ton / year)
2018	15.32	1.23
2019	15.36	1.21
2020	15.41	1.11
2021	15.54	1.09

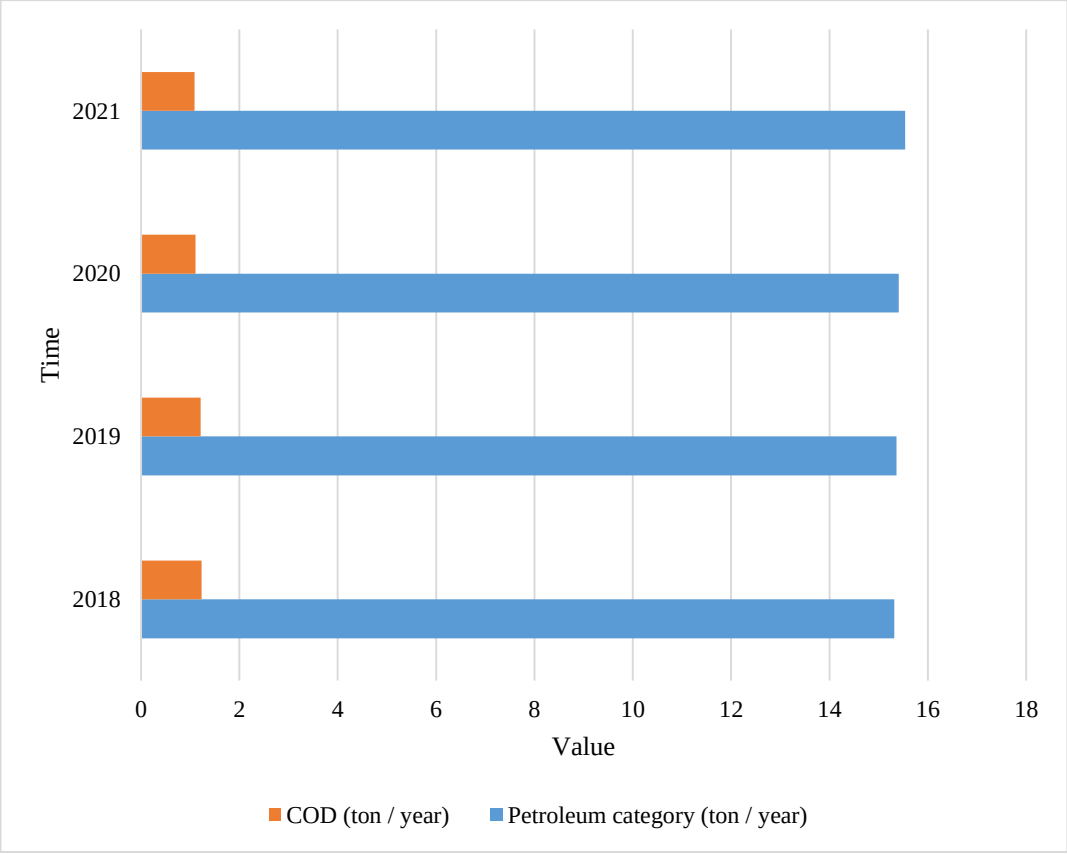

Figure 2. Marine engineering pollutant discharge data diagram

4.2. Analysis of Spatial Changes in Ecological Environment and Economic Damage

To directly reflect the degree and scope of the damage to the marine ecological environment, this paper selects the survey data from 2018 to 2021 for calculation, and analyzes the damage to the ecological environment from the time and space scales based on numerical changes. Time trend analysis extracts data from typical years, observes changes in ecological damage in different areas of the sea area from time scales, and conducts comparative analysis. The ecological environment damage assessment of each sea area at the same time is shown in Table 2 and Figure 3:

Table 2. Ecosystem damage assessment at same times in each sea area

Time	Sea area	Dilution zone	About 500m outside of the mixed zone
2018	0.23	-0.14	0.42
2019	-0.18	0.24	0.51
2020	0.7	0.31	-0.16
2021	0.14	-0.27	0.17

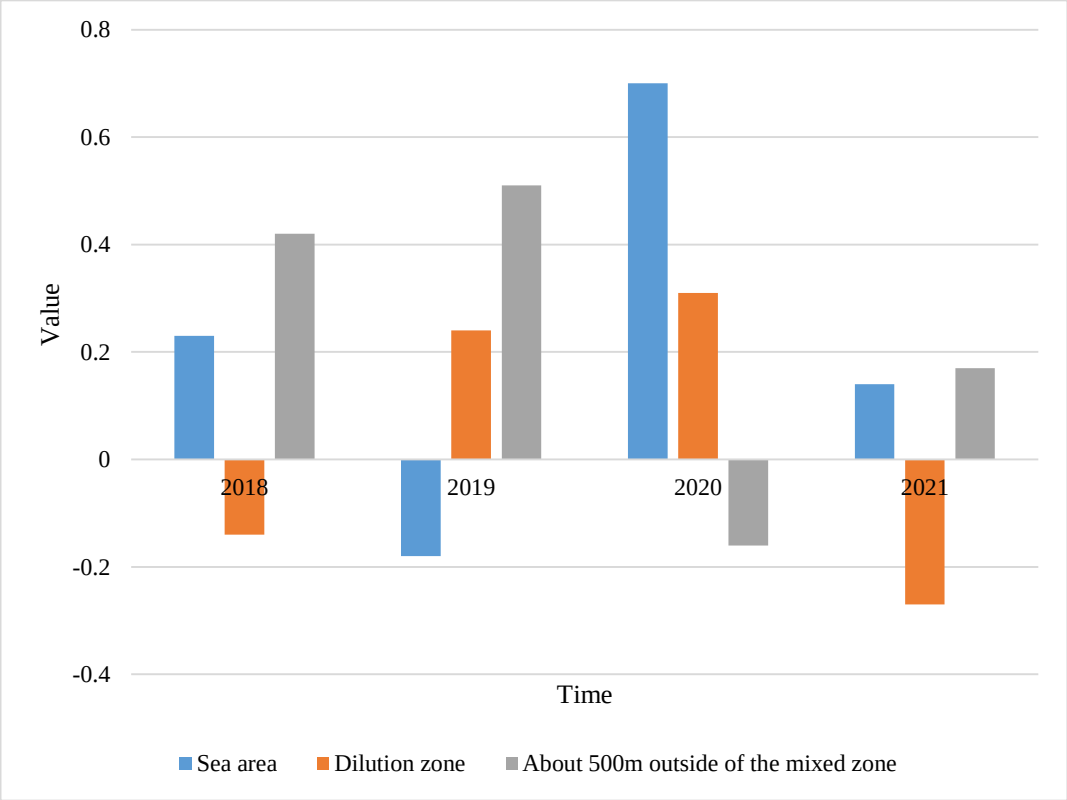

Figure 3. Data diagram of the evaluation results

The results showed that the ecological health of the sea area gradually improved from 2018 to 2021, the damage to the ecological environment gradually became smaller, and the seasonal changes in the ecological health were not obvious. The change trend of ecological environment health in the sewage mixed area and 500m outside the mixed area is the same as that in Weizhou sea area. At the same time, the health of the ecological environment in the 500m sea area outside the mixed sewage area is slightly better than that of the mixed area, and the damage to the ecological environment is slightly better than that in the mixed area. At the same time, the damage to the marine environment affects the improvement of the aquatic industry. The economic improvement of the aquatic industry in M City is worse as the ecological environment is

damaged.

5. Conclusion

At present, the vast majority of oilfields in my country are in the middle and late stages of improvement. It is extremely urgent and important for each oilfield to improve environmental and economic profit and loss analysis in the environmental application research of offshore oil and gas improvement, and to find out targeted measures. Oil and gas energy is an important strategic energy source in my country. In order to ensure national energy security, my country must strengthen domestic oil and gas improvement and increase oil and gas production. Environmental and economic profit and loss analysis is an important part of oil and gas improvement in the environmental impact assessment of marine engineering, which is of great significance to oil and gas improvement. Scientific environmental and economic profit and loss analysis can help oilfields to grasp the economic situation of oil and gas improvement in a timely manner, and take targeted measures to improve the economy.

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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.

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