

Abstract

Keywords

1. Introduction

2. Methods


2.1. Framework of marine ecosystem services

2.2. A modified benefit and cost analysis model based on ecosystem services

3. Case study

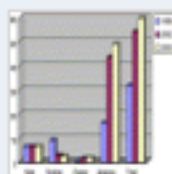
3.1. Study site

3.2. Identification of candidate mariculture modes in Sanggou Bay

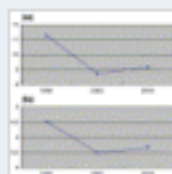
 Table 1

3.3. Valuation on the ecosystem services affected by mariculture activities in Sanggou Bay


3.3.1. Food production




3.3.2. Oxygen production




3.3.3. Climate regulation

 Table 2

3.3.4. Waste treatment

 Table 3

4. Result

 Table 4

5. Discussion

Acknowledgement

References


Benefit and cost analysis of mariculture based on ecosystem services

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Abstract

As a life-supporting system, marine ecosystem provides various services for human being. Based on ecosystem services, we developed a Benefit and Cost Analysis model to balance the conflicts between economic income and environmental loss caused by mariculture activities. This model not only calculates market income of mariculture but also monetizes the positive and negative effects of mariculture activities on ecosystem services. In this model, three indices, the NPV (Net Present Value), BCR (Benefit to Cost Ratio) and RC (Relative Coefficient) with consideration of discount rate, are developed to assess and prioritize the candidate mariculture modes. This Benefit and Cost Analysis model was applied to Sanggou Bay, one typical mariculture bay in China, to identify sustainable mariculture mode. In this paper, we find that benefit and cost analysis based on ecosystem services value provides a convenient and effective tool to compare different exploitation modes of marine ecosystem.

Keywords

Benefit and cost analysis; Marine ecosystem services; Mariculture mode; Sanggou Bay