An Analysis of Tourist Participation Restoration-Ecotourism through Systems Thinking

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Abstract. The purpose of this paper is to suggest a new form of Ecotourism, Tourist Participation Restoration-Ecotourism, based on the system thinking perspective using causal loop analysis. Analysis target area is Dadaepo which is not only ecologically important place but also famous tourist site. Three causal loop diagrams are developed, and a mutuality among variables are found. From these, variables that management harmful effects are elicited. The results are as follows. Release some marine seedlings with tourists and reduce the damaging of environment. The obstacle of ecological tours is the disruption of ecosystem. Give an education to the tourists about the environment in advance and limit the number of seedling that is released through the quiz, thereby preventing secondary damage to the ecosystem. Managing the decline of biodiversity is a establishment of standards. If the diversity falls below the standard, prevent the release of seedlings for maintain the biodiversity. This can be care for ecosystem of tourist site and satisfy the needs of tourists. The conclusion provides some research implications and future research direction.

1. Introduction
One of the benefits of the restoration of the mudflat ecosystem is the enhancement of cultural services. Ecotourism incorporates various types of trends such as bird watching, science research, photography, and tracking. It can be viewed as a subset of natural tourism activities, and can lead to increased incentive for natural environment experience and preservation. In ecotourism, it is important to balance the environment with maintaining the diversity of the environment and achieving economic benefits using the ecosystem. In particular, the most important means of sustaining sustainability is to limit the number of tourists to prevent damaging the ecosystem[1]. But controlling demand is a significant loss in terms of economic gain through the tourism industry. Thus, the pursuit of tourist control and the pursuit of economic profit is the biggest dilemma of ecological tourism. Also, when selecting ecological tourist sights, places that are worth protecting, especially those with beautiful views, are main targets. However, the areas designated as protected zones are difficult to experience and do activity other than observing natural landscapes[2]. However, experience in tourist attractions plays an important role in the satisfaction of tourists and the visits to the revisit[3]. Also, eco-friendly and cultural experiences increase the attractiveness of ecotourism[4]. However, it is a great disadvantage to the existing ecological tourism sites to limit such activities. In addition, where the landscape is damaged it is difficult to develop as eco-tourism destination is also an unfortunate part of the existing eco-tourist destination selected points.
Therefore, for sustainable ecological tourism, tourists must have a good influence on the environment. It is also important to find ways to reduce control over the number of tourists. Also, tourists should provide satisfactory activities without having to compromise on the ecosystem. Lastly, it should be possible to develop eco-friendly tourist sites despite, the fact that ecological values have already decreased. This can extend the width of eco-tourism site and contribute to the popularization of ecological tourism. In this paper, to suggest a new form of Eco-tourism, Tourist Participation Restoration-Ecotourism. Analysis target area is Dadaepo which is not only ecologically important place but also famous tourist site. Through the problems and tourism issues of eco-tourism, we looked at how such problems could be offset.

2. Advanced Research

2.1. Eco-tourism
Since Korea hosts a tourism program centering on visitors, it has increased the risk of developing harmful environments to tourists, such as noise and pollution from visitors. However, the ecological tourism program minimizes the risk of ecological tourism by operating a strategic ecological tourism program that provides visitors with a chance of exploring nature and cultural resources, including wildlife and aquatic biology[5].

To induce people to be attracted to eco-tourists, it is not simply a sight seeing place, but the place that can be developed as experience variety of programs[6]. The more beneficial the experience is, the better the satisfaction of tourism, the better the organization of tourists, and the greater the change in attitude of tourists. As eco-friendly and cultural experiences increase, the attractiveness of eco-waving and tourism increases, and the quality of tourism is also increased through the protection of marine resources[4]. Plus, environmental responsibility of eco-tourist site has significant indirect effect on tourists’ loyalty through cognitive and affective images[7].

Furthermore, it is important to deepen the understanding of environmental conservation and use it as a venue for environmental education, considering the importance of environmental conservation. Also, it is important to receive environmental education through expert advice or guidance from eco-focused tours. As for environmental preservation, it is essential to prevent environmental pollution, so it is regarded as one of the most economical measures for economic and social members, as it is one of the most economical measures for the economy[8].

In this study, we intend to contribute to developing eco-friendly programs by suggesting ecological rehabilitation activities that can reduce the ecological effects of tourists, as well as experience the ecological effects of tourists.

2.2. Fish Seeds Release
Restoration of marine ecosystems in Korea is largely divided into ‘restoration of marine ecosystems’ and ‘restoration of the fishery ecosystem’. The fishery seed discharge project is a project to directly discharge the seeds of the fishery seed or shellfish, and is designed for restoration of fishery profits rather than restoring the ecosystem[9]. The fishery seed discharge project is also intended to increase fishing profits, and it is not intended to be a practical idea for reviving the ecosystem because it is intended to increase fishery profits rather than reviving the ecosystem. In this study, the general public wants to offer ecological restoration tours, which allow ordinary people to participate in the ecological system and enhance the quality of the ecosystem, not to mention other goals.

3. Analytical method

3.1. Research Area
Dadaepo Beach is located on the southwestern coastal area of the Nakdong-River, and it is the only beach that consist of a mud flat. The freshwater and salty water is mixed, and the sand mudflats are formed by deposits of sediment from the Nakdong-River. And there is a wide range of sandy beaches, 900 meters wide and 100 meters wide.

They rent tools for ecological activities like they can collect marine things and release them again, but they are not management well. Moreover, prior education is not doing well for tourists so they become confused. Figure 1. shows that the development of new tourism programs is needed here. In ‘A study
on the Users’ Awareness of Waterfront in Busan’s Main 7 tourist area’, unlike other places, they replied with ‘Unsatisfactory’ or ‘Very unsatisfactory’[10].

![Figure 1](image.png)

**Figure 1.** Overall recognition and satisfaction of the famous waterfront tourist area

3.2. **Research Method**

The system dynamics understands and explains the phenomenon in terms of dynamic and cyclical causation. Also, build a computer model based on this understanding. This is a method of experimenting on how a complex phenomenon of a complicated causal phenomenon varies dynamically into the computer. It is also a view of the phenomenon and the framework of accidents. Casual Loop Diagram can help determine the cyclic causation of variables that make up the system. If the relationship between variables is equal, they have ‘positive causation’. In contrast, there is a ‘negative causal relationship’. The feedback relationship is divided into ‘reinforced loops’ and ‘balanced loops’. The reinforced loop is continuously progressed in a single direction unless any relationship has been severed. And the balanced loop indicates a steady state[11]. This method was a proper method due to the review of the overall changes over time and the causal relationship between variables.

First, a theoretical consideration was given to existing tourism patterns, damage, ecological tourism and ecological restoration, based on academic journals, related statutes, government agencies and newspaper articles. Second, individual causal loops were developed for the environment in which the existing environment and ecological restoration of the Dadaepo area were introduced. Finally, based on the individual causal loops, the integration causal loops are made. On that basis, proposed a sustainable ecological tourism plan at Dadaepo Beach. The study found that variables were not affected by an open circuit, but rather by interacting with causal relationships[12]. This will give you a systematic, integrated approach that will give an effective and practical approach.

4. Result

4.1. **An analysis of Factors Affecting the Quality of Dadaepo Beach**

Figure 2 shows the system casual loops diagram of the Dadaepo area. This is currently analysing the environment of Dadaepo Beach. ‘Regulating service’ and ‘cultural services’ represent ecosystem services. Regulating services refer to the value of the role in which the organisms remove and hold harmful pollutants such as phosphorus, industrial wastes, and heavy metals emitted by human activities. Cultural services are valued at leisure, tourism and education, and can be obtained without direct consumption or destruction of the ecosystem[13].

Since the Dadaepo beach is the place that meets the rivers and oceans, there is lots of nutrients. Therefore, many organisms inhabit here, and they provide organic matters to the next feeding class. When the creatures dig through the holes in the mudflats, the water penetrates through the holes and supplies oxygen to the sediment. It is showing positive feedback as shown in L1 and L2. Also, the purification of the water quality through the regulating services and the supply of organic matter and
oxygen through Benthic organisms have ‘delay effect’. There is an urgent need for preventive measures for long-term conservation, as the construction of Dadaepo Port has been planned and the pollution through the Nakdong-River is steadily draining. Accordingly, the positive reinforce loop on L1 is in danger of breaking. In L3, as the quality of the landscape increases, the value of tourism rises and the number of tourists grows, therefore, it seems that there is only a positive effect. However, it is possible to see the decline in the ecosystem of the mud flats because of the inflow of tourists.

![Diagram of Dadaepo Beach](image)

**Figure 2.** Casual loops diagram of Dadaepo Beach

### 4.2. Prediction Casual Loops Diagram during the Tourist Participation Restoration-Ecotourism

Figure 3 shows the prediction system casual loops diagram of the Tourist Participation Restoration-Ecotourism. The main activity here is the release of marine plants and seeds. To increase biomass of marine organism, it is a way to release the seeds of fish and shellfish. In the case of a practical project, there is a positive effect on the cultivation of fishing income, as well as increasing the quality of the resource management awareness and increasing the supply of high-quality fisheries products. Such activities with tourists can lead to a decrease in destruction of the environment by them. It is S1 that represents this part. However, there is a danger of ecological disturbance as it is an activity that allows organisms to be released directly into the ecosystem. S2 represents these problems. Provide prior education for the complexities of ecosystem and the importance of restoration. With this context, make a quiz and obtain a certain amount of marine seeds. This can prevent inadvertent discharge of releasing beyond environmental capacity. In addition, one can enjoy the educational effects of biodiversity, the importance of mudflow, and the animals observable at the Dadaepo beach. This curriculum is very important, because discharging the certain types of seed, not considering the environmental capacity of the oceans, is concerned about the disturbance of ecosystem and decrease in fishery resources[9].

Marine seedlings are cultured from the laboratory, and there is a risk of lowering the genetic diversity of organisms[9]. This part of the story is S3. Make a thorough preparation to prevent a reduction in
genetic diversity by establishing various criteria and avoiding inadvertent deviations from inadvertent standards.

![Casual loops diagram](image)

**Figure 3.** Casual loops diagram of Tourist Participation Restoration-Ecotourism

4.3. *Integration Casual Loops Diagram*

Figure 4 shows an integration diagram of individual casual loops that discussed earlier. Combine the Figure 2 that shows the existing environment and a casual loops of Figure 3 which can be kept sustainably managed, prediction casual loops diagram about the Tourist Participation Restoration-Ecotourism is made. The ecological damage problem caused by the increasing number of tourists is offset by the outflow of marine products. Also, the problems expected to occur due to restore activities will also be managed together in various ways, resulting in sustainable ecological tourism, even if there is no need to excessively limit the number of tourists.
However, the inflow of pollutants through the Nakdong-River or development through reclamation projects is a large-scale project that can not be prevented through the ecological tourism project. In the meantime, it was revealed that the restoration project of the government should be carried out at a certain level in order to develop an ecological rehabilitation tourism program. Further, continuous follow-up management should be continued to prevent secondary damages caused by the release of marine products, and the decrease in genetic diversity [14].

5. Conclusion and Suggestion
The study focused on the ‘Tourist Participation Restoration-Ecotourism’ at the Dadaepo beach, which is threatened by reckless exploitation in spite of the importance of mud flats, that can decrease the bad influences by tourists. Through this study, visitors will be able to provide experience that satisfy themselves, while reducing the risk of ecological disruption. Furthermore, Dadaepo Beach will turn over to the site for sustainable ecological tourism. However, since tourists are directly affected by the ecosystem, special follow-up management is required. Also, it will be more effective to work with the government unless it can be resolved with the tour program. It is a program that aims to solve the major dilemma of ecotourism, seeking a profit and protecting the ecosystem at once. This implies that both tourists and working-level employees have proposed a sustainable form of ecological tourism and confirmed their feasibility.

Dadaepo is geographically close to ‘Eulsukdo Ecology Park’, habitat of migratory birds, and ‘Nakdong-River Estuary Eco Center’, so it is easy to develop an ecological tour course. If it can be proposed by a concrete species that can be released through subsequent studies, it is expected to be reborn as an ecological tourist site representing Busan.

6. References
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Figure 4. Integration casual loops diagram
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**Acknowledgments**
This study was supported by the BK21 Plus Program (Creative Academy of Ecoscience, 31Z20130012990) funded by the Ministry of Education and National Research Foundation of Korea.