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**JOHOR
INNOVATION
INVENTION
COMPETITION
AND
SYMPOSIUM
2023**



"Innovation Inspires a Society
to be Critical and Creative"

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" Innovation Inspires a Society to be
Critical and Creative"

Editors-in-Chief

**AHMAD KHUDZAIRI KHALID
NUR INTAN SYAFINAZ AHMAD**



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Preface

In the name of Allah, the Almighty who gives us the enlightenment, the truth, the knowledge and with regards to Prophet Muhammad (peace be upon him) for guiding us to the straight path. We thank to Allah for giving us guidance and strength to write this e-book.

This e-book compiles the extended abstracts that submitted to Johor Innovation Invention Competition and Symposium 2023 (JIICaS2023), where JIICaS2023 is a virtual platform for all creative minds to share and present their invention and innovation. The extended abstracts are divided into two categories, which are Category A (Higher Educational Student/ Any Recognized Institutional Students in Malaysia) and Category B (Primary/ Secondary School Students / Special Education School Students in Johor). Each abstract gives a brief background on the innovation or project.

We hope that this e-book will help the readers to get to know the innovation done by the students from both categories and get some ideas to develop future innovation products.



RAPID APPRAISAL FOR ECOSYSTEM SERVICES ASSESSMENT: APPLYING THE TESSA TOOLKIT IN PANTI RECREATIONAL FOREST, JOHOR

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ABSTRACT

This research project addresses the decrease in natural forest products and the importance of considering stakeholders' perspectives in natural resource management efforts. The objectives of the project are to investigate the potential threats affecting the sustainability of Panti Recreational Forest as identified by stakeholders and to determine the perceived ecosystem services by the stakeholders in the area. The rapid appraisal approach from the Toolkit for Ecosystem Services Site-Based Assessment (TESSA) is applied to gather insights from the stakeholders before conducting a comprehensive analysis of ecosystem services. The project includes representatives from various stakeholder groups including the local authorities, professional groups, chalet operators, business operators, community leaders and local communities, with a total of 60 respondents. The project reveals that water management emerges as the most likely issue to occur shortly due to the daily water usage in the area, posing risks to the local community's drainage system. Additionally, the project highlights that the recreational forest provides nature-based recreational opportunities for tourists and local visitors, thereby contributing to the economic sector of the region. By considering the perspectives of various stakeholder groups, effective strategies can be developed to address the identified threats and ensure the sustainable utilization of ecosystem services. Furthermore, the project underscores the positive impacts of the recreational forest in promoting sustainable recreational opportunities that safeguard the forest's ecosystem services while supporting economic growth.

Keywords: ecosystem services, TESSA toolkit, rapid appraisal, stakeholders assessment

1.0 INTRODUCTION

The planning and management of recreational forests in Malaysia are constantly focusing on the opportunities for a variety of recreational activities to boost the local economic sector as well as improve people's quality of life. However, the need to preserve the natural environment is demanding as well. Incorporating stakeholders' values in the decision-making process will contribute to the planning strategies and management for the sustainable environment of the area.

Involving stakeholders' values and attitudes towards the management plan of the recreational forest is an essential step in reducing any conflicts that arise among the stakeholders' groups and producing a successful recreational forest implementation plan (Paletto A. et. al., 2014). Hussein M.K. (2014) researched to assess the involvement of stakeholder groups in the management process of recreational forests in Selangor and found that the landscape management strategies in managed recreational forests are not in line with the environmental sustainability approaches. On the other hand, Paletto A. et. al. (2016) stated that public administration is the most influential aspect of forest management issues. It is proven that stakeholders' assessments are highly needed in the process of managing recreational forests

as any actions taken could influence the way of life among the local community, affecting their economic sector as well as impacting tourism activities. Whenever there are any conflicts, ecosystem services provided by the area might deteriorate as time passes.

Millennium Ecosystem Assessment (MEA) (2005) defined ecosystem services as any type of benefit obtained from the ecosystem that might improve the well-being of humans. Ecosystem services are divided into four categories which are provisioning services (provide raw materials directly from the site such as timber), regulating services (natural benefits resulting from the existence of the area such as climate regulation), cultural services (opportunities offered by the area such as tourism) and supporting services such as the preservation of biodiversity.

2.0 OBJECTIVE

This research project aimed to assess the perspectives of stakeholder groups towards the ecosystem services provided by Panti Recreational Forest located in Kota Tinggi, Johor for the sustainable planning of the area. To achieve the aim of this project, two objectives were formulated. The first objective of the project is to identify which ecosystem services are the most valued and least valued by different stakeholder groups and to determine the possible threats that might affect the sustainability of the recreational forest.

3.0 METHODOLOGY

Toolkit for Ecosystem Services-Based Assessment (TESSA) is a designed tool to guide non-experts in identifying the ecosystem services provided by the area, the data needed to measure the ecosystem services, the method that could be used and how the results could be presented to all stakeholder groups to enhance the awareness regarding the ecosystem services of the area. The TESSA toolkit involved seven steps as the following:

- i. Scoping – to identify the assessment site and the plausible alternative site
- ii. Rapid appraisal – a workshop with stakeholders' groups to identify which ecosystem services to be assessed and the alternative site
- iii. Assessment – to carefully choose the relevant ecosystem services
- iv. Determining the alternative site
- v. Method selection – flexible method provided in the toolkit based on the decision trees
- vi. Data collection
- vii. Data analysis and presentation

This research project focuses on the scoping and rapid appraisal steps to determine which ecosystem services are most valued by the stakeholder groups, identifying the plausible alternative site and investigating the possible threats based on the viewpoints of stakeholders' groups that are likely to happen in the next 10 years.

Primary data collection of this project was using a structured questionnaire as provided in the toolkit which comprises three sections; demographic profile of respondents (Section A), value of ecosystem services (Section B) and the possible threats that might affect the sustainability of the forest (Section C). A total of 60 respondents came from different stakeholder groups such as the local community, community leaders, professionals, local authorities, chalet operators and local tourists were approached carefully to answer the questionnaire provided.

4.0 RESULT & DISCUSSION

Scoping analysis involves the process of selecting the most suitable ecosystem services based on the four categories of ecosystem services and secondary data collection helps in determining the relevant ecosystem services to the site. A list of ecosystem services that are

relevant to Pantii Recreational Forest was presented to the stakeholders' group and they were asked to rank the importance of ecosystem services.

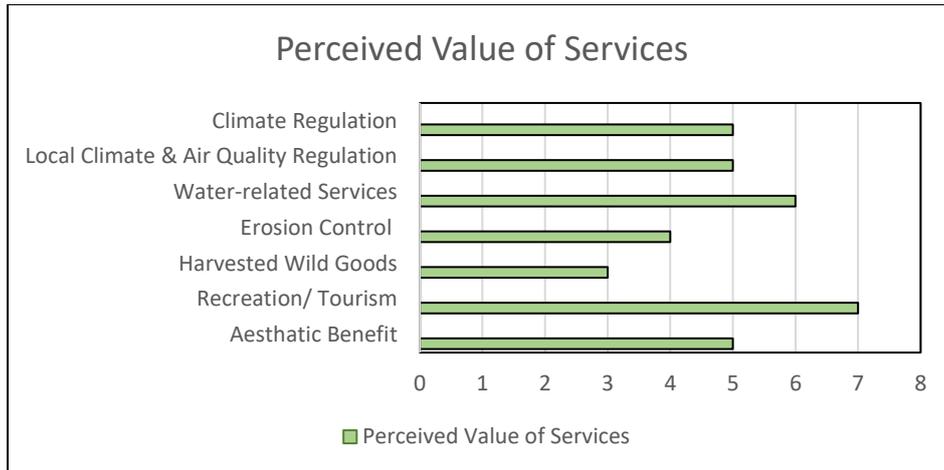


Figure 1: Perceived value of ecosystem services

Figure 1 above shows the perceived values of ecosystem services that respondents think are the most relevant to Pantii Recreational Forest and recreation or tourism activities received the highest score of 7. It is proven that stakeholders' groups are receiving well the role of the forest in providing recreational activities for the local community and attracting tourists to the area. Furthermore, Pantii Recreational Forest is a well-known natural setting with a rich diversity of flora and fauna and also has the potential for a natural conservation education program. Meanwhile, harvesting wild goods from the forest area received the lowest score as there is a current prohibition in harvesting any forest products from the area and this is well aware by the respondents.

A rapid appraisal form was extracted from the TESSA toolkit to measure the impact score of each possible threat that is likely to happen in the next 10 years and might affect the sustainability of the forest. The distribution scores were calculated based on the three elements which are timing, score, and impact. Each score for each element was added and divided into 60 respondents to obtain the mean of impact score. As a result, respondents were most concerned about the sustainable water usage issue in the area as the recreational forest is famous for its water-based activities but at the same time, the forest provided the main source of clean water for the local community. Therefore, the local community especially expressed their hope for the local planners and managers to come out with effective strategies to sustain the quality of the water. Thus, the score influenced the next possible threat listed which is water and air pollution. On the other hand, due to the encroachment from outsiders, it is found that issues such as illegal hunting of animals and deforestation are likely to happen if there are no actions implemented by the local authority.

Table 1: Mean impact score of possible threats

Possible Threats	Mean Impact Score
Usage and management of water resources	6.6
Water and air pollution	6.0
Illegal deforestation products	5.0
Development of residential and commercial areas	4.7
Environmental conservation projects	4.7
Hunting animals	4.7

Fire threat	5.2
Climate change and natural disasters such as flash flood	5.8

5.0 CONCLUSION

Diverse opinions from different stakeholder groups should be assessed to ensure there are no conflicts arise in the future. Perspectives from the stakeholders should be taken into consideration before implementing any management strategies for the area as any actions taken might influence the stakeholders' groups either directly or non-direct. Engaging stakeholder groups in identifying the relevant ecosystem services is a critical step in providing a clear understanding of the value of the services provided by the forest. This project is hoped to help planners and managers in the decision-making process and enforcing any management actions for biodiversity conservation and natural environmental settings. On the other hand, the TESSA toolkit applied in this project could be extended to be applied in other forms of recreational settings such as national parks, urban parks and community parks.

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