3rd INTERNATIONAL CONFERENCE ON ENERGY, ENVIRONMENT AND INFORMATION SYSTEM 2018 (ICENIS 2018)
Tuesday - Wednesday, August 14th - 15th, 2018
Theme:
“Strengthening Planning and Implementation on Energy, Environmental and Information System Toward Low Carbon Society”

Keynote Speakers

Prof. Dr. Fuyuki Shimazaki
Kyushu University, Japan

Prof. Dr. Mariadi
University of Malaya, Malaysia

Prof. Dr. Cheng Tiong
Universiti Teknologi Malaysia, Malaysia

Dr. Juniardi Riyadi
IKTI - Jepang

Dr. Ramazan Cahyana
Paparanajaya University of Technology Phuket, Thailand

Dr. Ang Gunawan
School of Postgraduate Studies Diponegoro University, Indonesia

A Call for Participant

After successful in the previous event with 200 selected papers, we invite you for 3rd ICENIS 2018 on August 14th - 15th, 2018 at Surabaya Premier Hotel Semarang with the theme “Strengthening Planning and Implementation on Energy, Environmental and Information System Toward Low Carbon Society”

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   - Energy Management and Policy
   - Energy Planning and Education
   - Energy Conservative and Efficiency
   - Energy Conservation Technology
   - Renewable Energy
   - Nonconventional Energy / Fossil Energy

2. Environment
   - Environmental Conservation
   - Environmental Policy, Planning and Education
   - Environmental Technology
   - Environmental Health and Toxicology
   - Environmental Epidemiology
   - Pollution Control
   - Waste Management
   - Green Infrastructure and Resilience

3. Information Systems
   - Business Intelligence
   - Supply Chain Information Systems
   - Industrial Value Chain Systems
   - Decision Support Systems
   - Social Information Systems
   - Health, Safety and Environment Information Systems

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   - Economic Perspectives to Low Carbon Society
   - Government and International Relations
   - Public Policy
   - Labour and Formal-Informal Workers
   - Society and Community
   - Media
   - Culture and Development

Publication

All accepted papers will be published in Scopus – Indexed IEB World of Conference Series.

Important Dates

Abstract Submission: before July 15th, 2018
Full Paper Submission: before July 30th, 2018
Early Registration Payment: before July 10th, 2018

Registration Fee

Before July 15th, 2018
- Indonesian Presenter: IDR 3,695,000/70paper
- International Presenter: USD 200/paper

Students Presenter: IDR 2,695,000/70paper
- Indonesian Presenter: IDR 1,695,000/70
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- Indonesian Presenter: IDR 3,775,000/70paper
- International Presenter: USD 200/paper

Students Presenter: IDR 2,895,000/70paper
- Indonesian Presenter: IDR 1,895,000/70
- International Presenter: USD 150/paper

Venue/Place

Surabaya Premier Hotel – Semarang
Pankoran Street, Number 195-196, Semarang, Central Java - Indonesia
Phone/Fax: +62 24 8483115 / +62 24 8483113

More Information

Conference Website:
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Organizing Committee

UNDIP
Preface

This is the proceeding of the 3rd International Conference on Energy, Environmental and Information System (ICENIS) 2018. The theme of ICENIS 2018 is "Strengthening Planning and Implementation Energy, Environment, and Information System Toward Low Carbon Society. ICENIS 2018 discussing the sustainability of the natural system, i.e energy management and policy, energy conservation, environmental education and planning, environmental conservation, environmental technology, environmental health, pollution control, waste management, green infrastructure and resilience, system information of supply chain and decision support system. Moreover the ICENIS 2018 introducing discussion of social aspect in low carbon society such as economic perspective, government, public policy and international relation, formal informal worker, gender, media and culture development

ICENIS 2018 organized by school of Postgraduate Studies, Diponegoro University has been conducted 14-15th August 2018. The conference has successfully performing forum to transferring and discussing research result among the researcher, students, government, private sector or industries. More than 390 participants and presenters from several countries such as Indonesia, Malaysia, Germany, Sudan, Australia, Japan, Libya have attended the conference to share their significant contribution in research related to energy, environment and information system. This proceeding contains 334 selected paper from the conference.

We would like to express our gratitude to all authors and members of scientific committee, reviewers and also organizing committee for their contribution to the success of the conference.

Guest Editors

Prof. Hadiyanto
Dr. Eng. Maryono
Dr. Budi Warsito
Statement of Peer review

In submitting conference proceedings to Web of Conferences, the editors of the proceedings certify to the Publisher that

1. They adhere to its Policy on Publishing Integrity in order to safeguard good scientific practice in publishing.

2. All articles have been subjected to peer review administered by the proceedings editors.

3. Reviews have been conducted by expert referees, who have been requested to provide unbiased and constructive comments aimed, whenever possible, at improving the work.

4. Proceedings editors have taken all reasonable steps to ensure the quality of the materials they publish and their decision to accept or reject a paper for publication has been based only on the merits of the work and the relevance to the journal.

Title, date and place of the conference

The 3rd International Conference on Energy, Environmental and Information System (ICENIS 2018)
14-15 August, 2018
Semarang, Indonesia

Proceedings editor(s):

Prof. Dr. Hadiyanto, MSc  Dr. Eng. Maryono, MT  Dr. Budi Warsito Msi

Date and editor’s signature: November 14, 2018
Strategy for Biodiversity Conservation Efforts in Wasur National Park of Merauke in Merauke Regency

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Abstract. Development of Wasur National Park can drive the economy, improve local and national images, improve public welfare through purchase of local product, open jobs and increase regional income. Tourism sector will be an effective means. The research type was descriptive by using qualitative approach by analyzing SWOT strategy, analysis diagram and determination of strategic initiative priority. There were four results. The alternative SWOT strategy referred to diversification or integration strategy diagram at quadrant IV : S-O (strength and opportunity) Strategy, inventory of potentials of natural and human resources to support research and education as well as culture; S-T (strength and threat) Strategy, Having fauna tourism potential and local village areas to support community economy for environmental conservation.; W-O (weakness and opportunity) Strategy, improvement of human resources of local village; W-T (weakness and threat) Strategy Requirement for work group guidance for local community in the conservation area to facilitate supervision and utilization of human resources in the conservation area. The strategic priority to start was cooperation with related party to improve very low range of control of related institutions. Use strategy to reduce carbon emissions conservation area and neighboring areas conservation city merauke particularly affected direct against urban development

Keywords: Wasur National Park, SWOT, Alternative Strategic Priority.

1 INTRODUCTION

Merauke Regency is a regency in Indonesia located in Southern Papua Province. Its forest is 95.3% of its total area, located east-most of the country. The regency is bordered by Papua New Guinea. Its area is 45.071 Km² and it has rich natural resources with ±40.5 million Ha of forest. It has a National Park which is the habitat of many types of organisms. Many variations of existing population form diversity which makes the ecosystem in the National Park a natural heritage which must be protected and conserved. Biodiversity consists of flora (plants) and fauna (animals) living across Wasur National Park.

Wasur National Park is a vast tropical forest with an area of 4.138 km². As a wildlife reserve and nature preserve, it has the largest number of endemic animals and plants in Papua. There are rare animals, such as bird of paradise, cassowary, kangaroo, arwana, etc. Furthermore, some lakes and marshes offer natural beauty. The potentials in developing Wasur National Park have bright future in the future and will provide attraction for visitors, whether those from local communities or from other regions who visit Merauke Regency. Wasur National Park is also known as Serengeti of Irian. Serengeti is the name of a national park in Tanzania, Australia. Meanwhile, “Wasur” comes from the word “Waisol” which in Marind language means park. Wasur National Park is a national park in Merauke Regency-Papua. Wasur National Park is established as a national park based on the decree of the Minister of Forestry number: 448/Menhut-VI/1990, dated 6 March 1990. The area of Wasur National Park is 413,810 ha. Flora and fauna potentials in Wasur National Park are massive. This park is established by the Minister of Forestry in 1997 from Wasur Wildlife Reserve and Rawa Biru Nature Preserve. Wasur National Park is one of 50 National Parks in Indonesia managed as UPT (Technical Implementation Unit) since 1997. TNW was previously managed by Natural Resources Conservation Sub-Center of Irian Jaya II C.q. Natural Resources Conservation Sub-section of Merauke and WWF ID. 0105 Merauke.

Therefore, Wasur National Park should be developed to be able to drive the economy, improve local and national images, improve public welfare through purchase of local product, open jobs and increase regional income. Tourism sector will be an effective means to distribute income to the society evenly from those with high income to those with low income from other regions or countries.

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2 Research Method

The research type was descriptive by using qualitative approach by analyzing SWOT strategy, analysis diagram and determination of strategic initiative priority. Descriptive analysis aims to describe someone which is currently happening (event) factually, systematically, and accurately on the causes of a certain symptom. The research location was Wasur National Park, Merauke District, Merauke Regency, which has potential tourism site. The data collection technique was secondary data. Secondary data was collected from various reports and other references relevant with the research problem. Books, reports was studied (library research) in the Department of Tourism and Department of Regional Income of Merauke Regency.

RESULT AND DISCUSSION

Potential of Wasur Park Area

Wasur Park has the natural attractions of plants, animals or natural ecosystem, as well as interesting geological formation. It has sufficient area to ensure the conservation of potential functions and attractions to be used for tourism and outdoor recreation. The condition of the surrounding environment supports efforts of natural tourism development. The conservatory function of nature tourism park is protecting the life support system of the area around the TWA area. The academic function of nature tourism park is teaching about nature and developing science. The tourism function of nature tourism park is becoming tourist destination and outdoor recreation are supported by natural beauty and the ecosystem of the area.

2.1 Management and utilization of Nature Tourism Park

Nature Tourism Park has the following benefits: Nature tourism and recreation, research and development, education and cultural support activities. The management of Wasur National Park uses Zonation system based on: SK. Dirjen PKA No:15/Kpts/DJV/2001, dated 6 February 2001: Core Zone : Area ± 127.590 Ha, consisting of 2 (two) with the following perimeters : North ± 82 Km, South ± 184 Km with total perimeter ± 266. Forest Zone : Area ± 211.320 Ha, consisting of 2 (two) with the following perimeters: North ± 229,2 Km, South ± 316,8 Km with total perimeter ± 546 Km. Intensive Utilization Zone: Area ± 56.100 Ha with total perimeter: ± 380 Km. Residential Zone : Area ± 18.800 Ha with total perimeter : ± 73,6 Km. Wasur National Park includes; 1). Melaleuca Dominant Forest; 2). Melaleuca – Eucalyptus Co-dominant Forest; 3). Rare Forest; 4). Beach Forest; 5. Seasonal Forest ; 6). Riparian Riparian; 7). Mangrove Forest; 8). Savannah Forest; 9). Grassland Forest; 10). Marsh Grassland. Beside biological resources potentials in Wasur National Park, there are animal tourism potentials such as; 1). Mammals; 2). Birds; 3). Fishes; 4). Insects; 5). Reptiles and Amphibians.

2.2 Wasur National Park Development Strategy

2.2.1 External Factor Analysis

Table 1. Analysis of External Factors of Wasur National Park

<table>
<thead>
<tr>
<th>No</th>
<th>External Environmental Factor</th>
<th>Weight</th>
<th>Rating</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strength</td>
<td>Having tourism potential of RI and PNG border</td>
<td>0.15</td>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>Having potentials of educational tourism and research site</td>
<td>0.09</td>
<td>2</td>
<td>0.18</td>
</tr>
<tr>
<td>3</td>
<td>Having orchid cultivation</td>
<td>0.07</td>
<td>3</td>
<td>0.21</td>
</tr>
<tr>
<td>4</td>
<td>Having support from related institutions, including Wasur Park Conservation Center, department of forestry.</td>
<td>0.15</td>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>5</td>
<td>Having Bomi sai office which is conservation and research center</td>
<td>0.09</td>
<td>3</td>
<td>0.27</td>
</tr>
<tr>
<td>Total Score</td>
<td></td>
<td></td>
<td></td>
<td>1.86</td>
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### Threat

<table>
<thead>
<tr>
<th>No</th>
<th>Threat</th>
<th>Weight</th>
<th>Rating</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Threat on conservation area by economic activity of local communities</td>
<td>0.09</td>
<td>-2</td>
<td>-0.18</td>
</tr>
<tr>
<td>2</td>
<td>Traditional hunting which causes biological damage.</td>
<td>0.15</td>
<td>-1</td>
<td>-0.15</td>
</tr>
<tr>
<td>3</td>
<td>Customary land rights</td>
<td>0.15</td>
<td>-1</td>
<td>-0.15</td>
</tr>
<tr>
<td>4</td>
<td>Existing road between towns</td>
<td>0.06</td>
<td>-2</td>
<td>-0.12</td>
</tr>
</tbody>
</table>

**Score Weight**

<table>
<thead>
<tr>
<th></th>
<th>Weight</th>
<th>Rating</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Score</td>
<td>1</td>
<td>-2</td>
<td>-2.6</td>
</tr>
<tr>
<td>Total weight (Opportunity + Threat)</td>
<td>-2.6</td>
<td></td>
<td>-0.74</td>
</tr>
</tbody>
</table>

### 2.2.2 Internal Factor Analysis

#### Table 2. Analysis of Internal Factors of Wasur National Park

<table>
<thead>
<tr>
<th>No</th>
<th>Internal Environmental Factor</th>
<th>Weight</th>
<th>Rating</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>O</td>
<td>No internal factor analysis.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Protected by Law (Decision of Minister of Forestry: 448/Menhut-VI/1990, dated 6 March 1990) as conservation area</td>
<td>0.15</td>
<td>4</td>
<td>0.6</td>
</tr>
<tr>
<td>2</td>
<td>Flora and fauna diversity</td>
<td>0.18</td>
<td>4</td>
<td>0.72</td>
</tr>
<tr>
<td>3</td>
<td>Traditional or local communities</td>
<td>0.05</td>
<td>3</td>
<td>0.15</td>
</tr>
<tr>
<td>4</td>
<td>Adequate infrastructures</td>
<td>0.07</td>
<td>2</td>
<td>0.14</td>
</tr>
<tr>
<td>5</td>
<td>Easy road access</td>
<td>0.07</td>
<td>3</td>
<td>0.21</td>
</tr>
<tr>
<td>6</td>
<td>Potential with district or city for the need for clean water</td>
<td>0.08</td>
<td>2</td>
<td>0.16</td>
</tr>
</tbody>
</table>

**Total weight**

|                   |        |        | 1.98  |

| W  | No internal factor analysis.                                                                 |        |        |       |
| 1  | Inadequate facilities                                                                        | 0.08   | -2     | -0.16 |
| 2  | Nomadic communities                                                                          | 0.15   | -4     | -0.6  |
| 3  | Education and training on conservation which aren’t intensive and optimal                    | 0.1    | -3     | -0.36 |
| 4  | Biological and fauna potentials which haven’t been inventoried                               | 0.07   | -2     | -0.14 |

**Total Score**

|                   |        |        | -1.26 |

**Total weight (Opportunity + Weakness)**

|                   |        |        | 0.72  |

### 2.2.3 SWOT Analysis Diagram

*Corresponding author: ririhena@unmus.ac.id*
2.3 Strategy Determination by SWOT Matrix

<table>
<thead>
<tr>
<th>Strengths</th>
<th>Weakness</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>External</strong></td>
<td><strong>Internal</strong></td>
</tr>
<tr>
<td>1) Protected by Law (Decision of Minister of Forestry: 448/Menhut-VI/1990, dated 6 March 1990) as conservation area</td>
<td>1) Inadequate facilities</td>
</tr>
<tr>
<td>2) Flora and fauna diversity</td>
<td>2) Nomadic communities</td>
</tr>
<tr>
<td>3) Traditional or local communities</td>
<td>3) Education and training on conservation which aren’t intensive and optimal</td>
</tr>
<tr>
<td>4) Adequate infrastructure</td>
<td>4) Biological and fauna potentials which haven’t been inventoried</td>
</tr>
<tr>
<td>5) Easy road access</td>
<td></td>
</tr>
<tr>
<td>6) Potential with district or city for the need for clean water</td>
<td></td>
</tr>
</tbody>
</table>
Opportunity
1) Having tourism potential of RI and PNG border
2) Having potentials of educational tourism and research site
3) Having orchid cultivation
4) Having support from related institutions, including Wasur Park Conservation Center, department of forestry.

Support from related institutions, including Wasur Park Conservation Center, department of forestry.
1) Improving human resources of local villages
2) Research development and education to explore potentials in Wasur park area as a nature conservation

Threats
1) Threat on conservation area by economic activities of local communities
2) Traditional hunting which causes biological damage.
3) Rights on customary lands
4) Existing road between towns

Protecting fauna tourism potential
1) Local village communities which encourage economic activities of the communities for environmental conservation.

Guidance for work groups for local communities living in the conservation area
1) Cooperation with related party reduces very low range of control of related institutions.

Encourage economic activities for environmental conservation.

2.3.1 Analysis

S-O (strength and opportunity) Strategy
Inventorying potentials of natural and human resources can support research and education, thus being a role model of ecosystem balance and economic fulfillment of local communities. Development of flora and fauna can be opportunity for the area, having positive impact on educational tourism which prioritizes training on environmentally friendly management and nature and education on biodiversity and fauna.

S-T (strength and threat) Strategy
It has fauna tourism potentials of having 34 species of 80 mammal species identified, 114 protected species of birds (Aves), wetland which has aquatic potentials of being the home of 39 types of fish of 72 existing types and 25 types of protected reptiles and amphibians, local village communities which encourage economic activities for environmental conservation.

W-O (weakness and opportunity) Strategy
Improvement of human resources of local villages to work with the government to conserve the nature of the conservation area and improvement of the resources of the Department of Forestry, Wasur Park Center, university in research and education to explore the potentials in Wasur park area as a nature conservation.

W-T (Weakness and threat) Strategy
Requiring guidance for work groups for local communities living in the conservation area, thus facilitating supervising and utilization of natural resources in the conservation area without limiting the economic needs of local villages. Therefore, cooperation with related parties become stronger in protecting the sustainability of the conservation area from irresponsible people and reduce the very low range of control of related institutions.
2.4 Alternative Determination of Strategic Initiative Priority

<table>
<thead>
<tr>
<th>No</th>
<th>Strategic Initiative</th>
<th>Weight</th>
<th>Rating</th>
<th>Score</th>
<th>Strategic Initiative Priority</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>research and education as well as culture</td>
<td>0.1</td>
<td>2</td>
<td>0.2</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>Being role model for ecosystem balance and economic fulfillment of local community.</td>
<td>0.08</td>
<td>3</td>
<td>0.24</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Flora and fauna development</td>
<td>0.03</td>
<td>2</td>
<td>0.06</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>Training on environmentally friendly management of nature and education on biodiversity and fauna.</td>
<td>0.13</td>
<td>4</td>
<td>0.52</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Improvement of human resources of local villages</td>
<td>0.07</td>
<td>2</td>
<td>0.14</td>
<td>8</td>
</tr>
<tr>
<td>6</td>
<td>Research development and education to explore potentials in Wasur park area as a nature conservation</td>
<td>0.06</td>
<td>3</td>
<td>0.18</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>Protecting fauna tourism potential</td>
<td>0.09</td>
<td>1</td>
<td>0.09</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>Local village communities which encourages economic activities of the communities for environmental conservation</td>
<td>0.11</td>
<td>3</td>
<td>0.33</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Guidance for work groups for local communities living in the conservation area</td>
<td>0.14</td>
<td>3</td>
<td>0.42</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>Cooperation with related party reduces very low range of control of related institutions.</td>
<td>0.19</td>
<td>4</td>
<td>0.76</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td><strong>Total weight</strong></td>
<td><strong>1.00</strong></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

4 Conclusion

1. There are four Alternative SWOT strategies which refer to the diagram of diversification or integration strategy in quadrant IV:
   a. S-O (Strength and opportunity) Strategy Inventoruppy the potentials of natural and human resources to support research development and education, as well as culture
   b. S-T (Strength and threat) Strategy Having fauna tourism potential and local village communities which encourage the economic activities of the communities for environmental conservation.
   c. W-O (Weakness and opportunity) Strategy Improvement of human resources of local villages
   d. W-T (Weakness and threat) Strategy Requirement for guidance for work groups for local communities living in the conservation area to facilitate supervision and utilization of natural resources in the conservation area
2. Strategic priority to start the strategy is cooperation with related parties to reduce very low range of control of the related institutions. Use strategy to reduce carbon emissions conservation area and neighboring areas conservation city merauke particularly affected direct against urban development

References