The Application of Science and Technology for Regional Development of Edutourism Villages Based on Low Cost Ecotourism Integrated with Science Techno Park

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Abstract

Tanjung Pinang II Village is located 10 km from the administrative center of Ogan Ilir Regency, Indralaya. Tanjung Pinang II Village can be developed as a tourist area due to the easy access. The problems of a tourist village are unproductive of potential land, the emergence of noise pollution from blacksmith activities in residential areas, do not have a tourism management master plan; and The absence of basic infrastructure supporting ecotourism-based Edutourism. The solution of this problem is Counseling on Strengthening Human Resources in Edutourism Villages and Revitalizing Non-Productive Multi Sector Integrated Land as well as Cultivation Technique Training, Relocation of Blacksmiths to Integrated Areas and Planting Sound Barrier Plants, Making a Master Plan for Mapping the Development of Integrated Edutourism Areas in Science Techno Park (STP), Building Edutourism Supporting Facilities Based on Low Cost Ecotourism. The solutions offered are in accordance with the background of the expertise. The purpose of PIPK in Tanjung Pinang-II Village is to provide the solutions in the fields of production, management, marketing, infrastructure and the environment. The method of implementing this PIPK is analyzing the situation and conditions of partners, providing solutions to problems, Making Appropriate Technology (TTG) that will be transferred to partners, Training and Mentoring and Evaluation of Implementation of Activities. The results of the service can be concluded that this activity is a solution for Tanjung Pinang II Village to prepare itself as a tourist village.

Key words: ecotourism, lowcost, science techno park, sound barrier

INTRODUCTION

Ogan Ilir Regency has many tourist attractions that consist of various destinations with various uniqueness. Tourist attractions in the Regency are scattered in several locations, including Semambu Island, Supi Beach, Jodoh Beach, Sriwijaya Botanical Gardens, Teluk Seruo Lake, Burai Colorful Village, Ancol Tanjung Atap, Si Punai Garden Tourism Park, and Teluk Putih Seasonal Lake. Tourism attractions in Ogan Ilir Regency have the national quality. One of the most popular tourist destinations in Ogan Ilir Regency is in
Tanjung Batu District. This sub-district has 19 villages and 2 sub-districts. One of the villages in the sub-district is Tanjung Pinang II Village. Tanjung Pinang II Village is located 10 km from the administrative center of Ogan Ilir Regency, namely Indralaya. Therefore, the potential for Tanjung Pinang II Village is to develop into a tourist area due to its close access to the center of government and close to other leading tourist destinations in Ogan Ilir Regency. This village has good road access to tourist sites. The development of the Tanjung Pinang II tourist village is one of the efforts to improve the economy of local community.

The Problem in Community Service

Based on the analysis of community behavior during the visit and FGD, there are still many problems in this village, both from environmental, social, technological and economic problems that can be described as follows:

Unproductive Land Potential for Plantation, Agriculture and Fisheries. Abandoned land causes the land to be infertile. In fact, previously areca nut and perepat trees thrived in this village. In addition, agricultural and fishery activities are not well because the people here have not been trained in plant cultivation and fisheries so it increases the post-harvest losses that cause people to be reluctant to run this business.

In addition, agricultural and fishery activities do not run well because the people have not been trained in plant cultivation and fisheries so that post-harvest losses arise and cause people to be reluctant to run this business.

Based on information obtained from the village head, people often complain of noise caused by blacksmith activities. If the blacksmith activities are allowed to remain free without a special location policy being prepared, it is worried that it will cause more noise pollution. This free blacksmith activity is because Tanjung Pinang II Village has not integrated iron craft center that is designed to minimize noise pollution.

Integrated and Sustainable Tourism Management do not have master plan. This village has a dream to be a tourist village but until now the village apparatus do not have a concept map of village planning or a master
plan in the development of a Tourism Village. The efforts to develop a tourist village without a well-thought-out concept of short, medium and long term work plans will result in the absence of a clear direction. The lack of clarity of the concept will result the failure of the initial plan determined.

Teluk Perepat, as expected to be an Edutourism village, is still constrained by the lack of funding to build basic infrastructure as supporting facilities such as guide gates, parking locations, toilets, souvenir and craft centers, reforestation with typical plants such as areca nut and Perepat trees, lakeside seats, fish farming facilities, relocation of activities of blacksmiths and songket craftsmen. This basic infrastructure should be realized to increase tourist comfort and attractiveness with lowcost ecotourism. However, the village apparatus and the community do not have the ability to design and implement the concept.

Formulation of Community Service Goals

The purpose of PIPK in Tanjung Pinang-II Village is to provide solutions to the problems in the fields of production, management, marketing, infrastructure and the environment.

Solutions To Solve The Problem

PIPK Tanjung Pinang II Village is carried out by socializing the community to become a tourism-aware community by prioritizing local potential and wisdom such as the use of plants, crafts, culinary, fisheries, integrated agriculture in the Teluk Perepat area with the following stages:

1. Community Counseling for Strengthening Human Resources in Edutourism Villages and Revitalizing Non-productive Land Integrated Multi Sector and Cultivation Techniques, Revitalizing Non-Productive Land, This activity is carried out to manage non-productive land with systematic land data collection; fertility checks; inventory of revitalization needs and restore non-productive land, as many as 3 programs.
2. Relocation of Blacksmith Activities to Integrated Areas and Planting of Sound Barrier Plants, as an effort to form awareness of the impact of blacksmith noise pollution, namely by counseling the impact of noise pollution, relocating blacksmiths with natural sound barrier designs, and OHS training.
3. Create a master plan for mapping the development of the integrated Edutourism area of Science Techno Park. Making a Tourism Development Blueprint. This activity was carried out by a FGD with the Village Government, village assistants, the community and proposer company to create a Blueprint for the Development of the "Teluk Perepat" Edutourism Village for the next 3 years with Ecotourism-based Edutourism integrated with Science Techno Park.
4. Infrastructure development of Kampung Edutourism based on Low Cost Ecotourism such as supporting facilities in the form of growing gates, toilets, parking lots, souvenir sales centers, relocation of blacksmith crafts and songket craftsmen and kiosks providing food and beverages to "Teluk Perepat" based on ecotourism so that it becomes a tourist attraction.

Summary of Theoretical Studies Related to Problem Solving

The implementation of the Community Service is based on the activities and research of the previous implementation. Community service for tourism development related to the influence of component 4A on the visitors interest to tourist destinations (Alfitriani, Putri and Ummasyroh, 2021). The dissemination of IoT-based Integrated Solar Fish Cultivation Technology in Urban Farming in Improving the Economy of Fish Cultivation Groups has been carried out by (Masnila et al., 2022). Revitalizing Agricultural Land and Optimizing shallot planting in the Harapan Jaya Farmers Group, Talang Keramat sub-district (Febriantoko, Mayasari and Sepindjung, 2019)

The use of village funds with good intentions can affect poverty levels according to
research on the Effect of Village Funds and Allocation of Village Funds on Poverty in South Sumatra Province (Martini et al., 2021). The improvement in the quality of MSME products is necessary such as in the Optimization of Production and Sales of the Skippy Cake Business Group carried out by (Isa and Mayasari, 2022) and Improvement in business management and increasing the competitiveness of the SME group Rumah Tajung Antiq (RTA) that produces tajung and blongsong woven fabrics of Palembang in facing the new normal era (Sayuti et al., 2021).


Expectations of Results and Benefits of Community Service.

These community service activities are targeted as follows:

1. Improving the knowledge of partners regarding the increase of knowledge about the Edutourism village "TELUK PEREPAT" by 80%.
2. Improving partner skills related to improving knowledge in Aquaponics management by 85%.
3. Improving the quality of partner products related to Production improvement for MSMEs by 80%.
4. Improving partner management capabilities related to Business Management Improvement = 70%

RESEARCH METHODOLOGY

There are some stages in conducting community service among others:

1. Stage-I, Analysis of the partner situation and condition, at this stage the PIPK Team conducts surveys, collects data, identifies Partner problems, and conducts FGD with Partners.
3. Stage-III, Making Appropriate Technology (TTG) which will be transferred by partners, namely Aquaponics technology.
4. Stage-IV, Training and Mentoring includes:
   a. Community counseling and training related to the "TELUK PEREPAT" Edutourism village, PIPK counseling involves a combination of community groups, with the purpose of conveying the objectives of Community Service based on the PIPK program.
   b. Aquaponic management training, aims to utilize the flow of the Payo Pinang River as a leading tourist attraction for the "Teluk Perepat" Edutourism village.
   c. Trainers in production management training, during this training and mentoring was given simulations and making business strategies that can be applied to business actors in the "Teluk Perepat" Edutourism Village.
d. Business management training, training focused on business planning, organization, leadership, and business control in Teluk Perepat Edutourism Village

5. Stage-V Evaluation of Implementation Activities at this evaluation stage, evaluation activities were carried out by the PIPK team, as well as testing the influence of Human Resource Development on Tourism Management and the implications for Edutourism Village. The sample used were 200 respondents. Technical analysis using Structural Equation Modeling (SEM) with AMOS program.

RESULTS AND DISCUSSION

Results

The implementation of this activity is based on the problems experienced by partners and the determined solutions. Based on the method of implementing this activity, the targeted results were obtained.

Stage-I

This process of analyzing the situation and conditions of partners is carried out by conducting surveys, collecting data, identifying partner problems, and holding FGDs with partners. Analyze the situation through direct visits to partner locations. Direct visits are used to see the existing conditions before implementing community service programs.

Stage-II

At this stage, it is carried out by providing solutions to the problems that occur in couples, which is Counseling starting from Strengthening the Human Resources of the Edutourism Village and Revitalizing the Training of Unproductive Land Techniques Integrated Multi-Sector, Adjustment of Slope Geometry and Replanting of Areas, Resettlement of Areas. Activities of Blacksmiths to Integrated Areas and Planting Soundproofing Plants, Counseling on Economic Potential and Business Management, Providing Aquaponic plant media by utilizing fish fertilizer and developing infrastructure for the Edutourism Village.

The results of the implementation method of Community Counseling for Strengthening Human Resources. Community Counseling Activities for Strengthening Human Resources in Edutourism Villages and Revitalizing Non-Productive Integrated Multi Sector and Cultivation Techniques were carried out according to the set targets. This activity was carried out to manage non-productive land with systematic land data collection; fertility checks; inventory of revitalization needs and
restore non-productive land, as many as 3 programs.

Figure 4. Community Fish Cultivation Activities.

Figure 5. Fish Aquaponic Processing Activities by the Community

The results of Relocation of Blacksmith Activities. Relocation of Blacksmith Activities to Integrated Areas and Planting of Sound Barrier Plants, as an effort to create awareness of the impact of blacksmith noise pollution, namely by counseling the impact of sound pollution, relocating blacksmiths with natural sound barrier designs, OHS training, and targeting Sound Barrier planting of 50 meters long.

Figure 6. Blacksmith Room Design before relocation (left) and after relocation (right)

Figure 7. Japanese Bamboo Planting as a Natural Sound Barrier.

Create a master plan for mapping the development of the integrated education area of Science Techno Park. Creating a Tourism Development Blueprint was carried out by FGD with the Village Government, village assistants, the community and proposer company to create a Blueprint for the Development of the "Teluk Perepat" Edutourism Village for the next 3 years with Ecotourism-based Edutourism integrated with Science Techno Park. This blueprint targets international tourists to visit amounting to 100%.

Figure 8. Slope Revegetation Design

Figure 9. Long Term Tourism Area Concept Design

Infrastructure development of Kampung Edutourism based on Low Cost Ecotourism such as supporting facilities in the form of growing gates (1 gate), toilets (2 pieces), parking lot (1000 meters), souvenir sales center (1 unit), relocation of blacksmith crafts and songket craftsmen and food stalls and drinks to "Teluk Perepat" based on ecotourism so that it becomes a tourist attraction (3 Units).
Figure 10. Tourism Support Infrastructure Design

Figure 11. Basic Infrastructure Development and Solar Lighting

Figure 12. Business Space and Facilities in Tourist Areas

Stage-III
At this stage, the manufacturing of the appropriate technology is carried out which will be transferred by the partner which is the "Edutour Teluk Perepat System" based on the website and android technology and aquaponics.

Stage-IV
The level of socialization of the community and training related to the tourism village is carried out in an effort to give sufficient understanding to the partners regarding the preparation to become a tourism village.

Figure 13. Results of aquaponic applications

Aquaponics management training is conducted so that the community can continue to grow vegetables and become a productive activity for the community.

Figure 14. Educational village training activities

Production management training is conducted to understand the supply chain of production and sales. Production management is used to improve the quality of village-specific handicraft production.

Figure 15. Aquaponics training activities
Business management training is conducted to register the legitimacy of business in the village. This is useful for data collection by the government.

Stage-V

The stages in the Evaluation activity are carried out by teams from higher education institutions. Activities are carried out by testing the Impact of Human Resource Development on Tourism Management and its implications for Kampung Eduwisata. The sample used is 200 respondents. Technical analysis using Structural Equation Modeling (SEM) with the AMOS program. The evaluation results are as follows.

<table>
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<th>No</th>
<th>GoF Index</th>
<th>Value</th>
<th>Cut off Value</th>
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<tr>
<td>1.</td>
<td>Chi-Square</td>
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<td>&lt; 0.05</td>
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<td></td>
<td>Probability</td>
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<td>2.</td>
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<td>≤ 0.08</td>
<td>Good Fit</td>
<td>Marginal Fit</td>
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<td></td>
<td></td>
<td>0.08 - 0.10</td>
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<td>3.</td>
<td>NFI</td>
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<td>≥ 0.90</td>
<td>Good Fit</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>0.80 - 0.89</td>
<td>Marginal Fit</td>
<td></td>
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<tr>
<td>4.</td>
<td>TLI</td>
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<td>≥ 0.90</td>
<td>Good Fit</td>
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<td></td>
<td></td>
<td>0.80 - 0.89</td>
<td>Marginal Fit</td>
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<td>5.</td>
<td>CFI</td>
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<td>0.80 - 0.89</td>
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<td>6.</td>
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<td>Marginal Fit</td>
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Based on Table 1, the results of the Goodness of Fit Index showed that the overall model (Full Model) had four criteria for goodness of fit (Good Fit), namely the goodness of fit index TLI and IFI. Two goodness of fit criteria that were quite good (Marginal Fit), namely the Chi-Square Probability, RMSEA, this shows that the overall model (Full Model) produced had a good goodness of fit.

<table>
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<td>HR Development → Tourism Management</td>
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<td>HR Development → Edutourism Village</td>
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<tr>
<td>Tourism Management → Edutourism Village</td>
<td>0.287</td>
</tr>
<tr>
<td>HR Development → Tourism Management Edutourism Village</td>
<td>0.289</td>
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Based on Table 2. It showed that Human Resource Development had a positive effect on Tourism Management by 1.006, Human Resource Development had a positive effect on Edutourism Village of 0.727, Tourism Management had a positive effect on Edutourism Village of 0.287 and Human Resource Development had a positive influence on Tourism Management and its implications for Edutourism Villages of 0.289.

Discussion

Community service activities for Strengthening Human Resources in Edutourism Village have been carried out by (Satrio, Basuki and Kustiadi, 2021) with the results of increasing abilities in PGD, understanding the form of games in outbound, and being able to use social media for tourism promotion. Revitalization of Multi Sector Integrated Non-productive Land and Cultivation Techniques is carried out to manage non-productive land with systematic land data collection; fertility checks; inventory of revitalization needs and return of non-productive land. This activity generates added value for every asset owned by the Village Government that is similar to the activities carried out by (Fariroh, Novikarumsari and Utami, 2021).

The results of the blacksmith activities relocation to the Integrated Area had been successfully carried out and the Planting of Sound Barrier Plants as an effort to reduce blacksmith noise pollution had been done. The solution is the planting of natural Sound Barriers in the form of Japanese bamboo plants. This plant is one of the plants that can reduce noisy sounds (Nurasha, 2020).

Creating a master plan for the development of an integrated edutourism area of Science Techno Park was very well done. Creating a Tourism Development Blueprint, this activity was carried out by a FGD with the Village Government, village assistants, the community and PT Prosecutor to make a Blueprint for the Development of the "Teluk Perepat" Edutourism Village. Similar activities have been implemented at Bukit Tulen Telase Tourism, Air Limau Village by (Mallangke, Sinangjoyo and Hermawan, 2022). The creation of master plan serves as a reference for tourism development.

Basic tourism supporting facilities can be realized through infrastructure development. This related research was conducted by (Putri, Farida and Dewi, 2015) in the Borobudur temple area. Basic facilities function as a means of supporting tourism as mandatory in nature (Darwis, Hendraningrum and Adriani, 2016).

SEM analysis in this service is to find out more clearly about the influence of Human Resource Development on Tourism Management and the implication for Edutourism Village.

In line with empirical study conducted by Arifianto et al., (2019) that states the Human Resource Development in Realizing Independent Villages can be done by providing assistance and training so that village communities can continue to work. So that the community can see the potential of the village so that it can be developed into a tourist village. According to Ammar, (2021) in addition to developing human resources for rural communities, the development planning process must also be able to think about the needs and benefits of rural communities without damaging the ecosystem in the village and can have a good effect on the community, especially in areas that support the economy and welfare of village communities.

Conclusion

In the Community Service Activity of the Regional Development Science and Technology Application Scheme, it can be concluded that this activity is a solution for Tanjung Pinang II Village to prepare as a tourist village. The novelty of this community service is the establishment of basic tourism supporting
facilities as well as a science techno park that is ready to be developed.

**Recommendation**

For further activity, it is recommended to start training activities for tourism promotion, collaboration with various institutions, and adding tourism supporting infrastructure while still prioritizing ecotourism. Furthermore, further service can make the village becomes an area for the application of science and technology from universities.

**REFERENCES**


