

Impact Analysis of The Benefits of Heach Heater (*Eichornia Crassipess*) for The Environment in The Batu Jai Dam Area, Central Lombok District

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Abstract: The Batu Jai Dam functions as an irrigation facility in the agricultural areas of Penujak, Setanggor, Darek, Ungga, Ranggagata, and around Praya Barat District, Central Lombok Regency with an area of 3,350 ha. Water hyacinth is a dangerous weed because it grows very fast, so a model for the control and utilization of water hyacinth (*Eichornia crassipes*) must be carried out. One way to do this is to utilize the water hyacinth plant into a marketable product such as fertilizer, handicraft products and others. The technique of determining the location and population is done by purposive sampling method. The results of a search with a questionnaire on 50 respondents about the benefits of water hyacinth plants obtained the benefits of water hyacinth plants according to the people around the Batujai dam, namely 40% stated that the benefits of water hyacinth plants as raw materials for making fertilizer, 30% as raw materials for crafts such as sandals, bags, and other, 20% of water hyacinth plants are used as medicine and only 5% of the people consider water hyacinth plants as weeds. Whereas in extension activities with 35 participants, 48.6% stated that water hyacinth plants could be useful as raw materials for crafts, 37.1% stated that they were used as fertilizer raw materials, 3% stated that they were useful as medicine and 2% stated that they are weeds. concluded that water hyacinth plants are economically, socially, ecologically beneficial. This shows that water hyacinth plants are beneficial to the environment around the dam. Based on the results of the FGD, there were 3 important activities carried out by related agencies based on the results of counseling and interviews with the community, namely water hyacinth plants as fertilizer, as raw materials for crafts and determining the location of water hyacinth cultivation outside the Batujai Dunngan.

Keywords: Dam Area; *Eichornia Crassipess*; Heach Heater; Environment

Introduction

The Batujai Dam is an irrigation facility in the agricultural areas of Penujak, Setanggor, Darek, Ungga, Ranggagata, and around Praya Barat District, Central Lombok Regency with an area of 3,350 ha (Sasaqi, 2019). Previously, rice fields in the area were rain-fed rice fields. With the development of the environment around the reservoir and changes in land use in the upper reaches of the river, the benefits of the dam to irrigate the rice fields are decreasing day by day to an area of 2,426 ha, also due to the high sediment entering the dam. The existence of this dam can also regulate the peak discharge from flooding from 1,332 cubic meters per

second to 764 cubic meters per second or can reduce flooding by 568 cubic meters per second so that bigger consequences can be avoided (Hakim, 2018; Saputra, 2018).

The Batujai Dam is a multifunctional dam used for irrigation of 3,000 ha (Rasyidi, 2017), a microhydro power plant with a maximum installed capacity of 150 KW, flood control, raw water supply and tourism in the Praya Region, Central Lombok Regency. One of the dams that has problems with sedimentation is the Batujai Dam, plus the function of the dam is starting to get disrupted due to the growth of the water hyacinth (*Eichornia crassipes*) which is a weed that is getting more and more day by day until it covers the surface of

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the dam. This can be dangerous for the organisms in the dam, besides that the impact is also felt by the people who work as farmers and fishermen around the dam.

Water hyacinth (*Eichornia crassipes*) is an aquatic weed that has a high growth rate so it can damage the aquatic environment (Kurniadie et al., 2023; Prasetyo et al., 2022), including increasing evapotranspiration (evaporation and loss of water through the leaves within 52 days, each water hyacinth stem is capable of producing 1 m² of new plants. The use of water hyacinth plants as fertilizer because the remaining organic matter Sofyan et al. (2023), from these plants contains a lot of macro nutrients such as N, P, K which are needed for the growth of cultivated plants (Peng et al., 2023). This is a form of effort that can be carried out by the community and the government so that water hyacinth is no longer a weed but plants that are beneficial to (Asriyana & Yuliana, 2021).

Given the very important role of the Batujai dam, a study is needed that examines the social, economic and ecological benefits of the dam by the people and government of Central Lombok. Related to the problems above, the researchers took the title "Analysis of Social, Economic and Ecological benefits of Water Hyacinth Plants (*Eichornia crassipes*).

Method

Time and Place of Research

This research was carried out for 8 months starting from November 2022 - June 2023 which was carried out in Batu Jai Village, West Praya District, Central Lombok Regency, West Nusa Tenggara.

Data Types

In this study used descriptive analysis with a qualitative approach. The approach can be interpreted as a scientific method that gives the main emphasis on explaining the basic concepts which are then used as a means of analysis (Prasetyo & Jannah, 2011).

Data Collection Techniques

The observation method can produce more detailed data regarding behavior (subjects), objects or events (objects) compared to survey methods. Interview using a questionnaire is a data collection technique that is carried out by giving a set of questions or written statements to the respondent to answer. Counseling is a technique for conveying information and collecting data used by researchers to collect data from those related to research. Forum Group Discussion (FGD) is an activity that involves respondents and stakeholders in discussing the issues being studied. Training is an

activity carried out to provide additional knowledge and skills directly to respondents that can be applied.

Data analysis

Stakeholder analysis

The method for data analysis used to determine the utilization of water hyacinth is stakeholder analysis (Van Oijstaeijen et al., 2020), which is a system of collecting information from individuals or groups of people who are influential in deciding, grouping information and assessing the possibility of conflicts that occur between interest groups (Pratiwi et al., 2018). The purpose of the stakeholder analysis is to find out the existing interests so that they can determine a decision/policy.

Multiple Linear Regression Analysis

Stakeholder Analysis

The method for data analysis used to determine the utilization of water hyacinth is stakeholder analysis, which is a system of collecting information from individuals or groups of people who are influential in deciding, grouping information and assessing the possibility of conflicts that occur between interest groups (Enyew et al., 2020). The purpose of the stakeholder analysis is to find out the existing interests so that they can determine something decision/policy (Damtie et al., 2022).

Multiple Linear Regression Analysis

Multiple linear regression analysis was carried out to determine the direction and how much influence the independent variables have on the dependent variable. Measuring the effect of variables involving more than one independent variable ($X_1, X_2, X_3, \dots, X_n$), multiple linear regression analysis is used, called linear because each estimate of the value is expected to experience an increase or decrease following a straight line. The formula for multiple linear regression analysis by formula 1 (Montgomery et al., 2021).

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + \dots + b_nX_n \quad (1)$$

Information:

Y : dependent variable (dependent)

X (1,2,3,...) : independent variable

a : constant value

b (1,2,3,...) : regression coefficient value

SWOT analysis

The model used for this situation analysis is SWOT Analysis. SWOT analysis is a systematic identification of various factors to formulate a strategy (Bajpai & Nemade, 2023; Sindhu et al., 2017). This analysis is based on logic that can maximize Strengths and Opportunities,

but simultaneously can minimize Weaknesses and Threats (Rangkuti, 2006) represented by Table 1.

Table 1. SWOT analysis

IFAS	Strenghts (S)	Weaknesses (W)
EFAS		
Oppurtunies (O)	SO strategy Create a strategy that uses strengths to take advantage of opportunities	WO Strategy Create a strategy that minimizes weaknesses to take advantage of opportunities
Treaths (T)	ST Strategy Create strategies that use strengths to overcome threats	WT Strategy Create strategies that minimize weaknesses and avoid threats

Quadrant I: Situations that have opportunities and strengths so that in these conditions aggressive policies can be applied. Quadrant II: In facing threats, but still has strength from an internal perspective. The strategy that can be applied is by diversification.

Quadrant III: In this position there are great opportunities but face internal constraints/weaknesses.

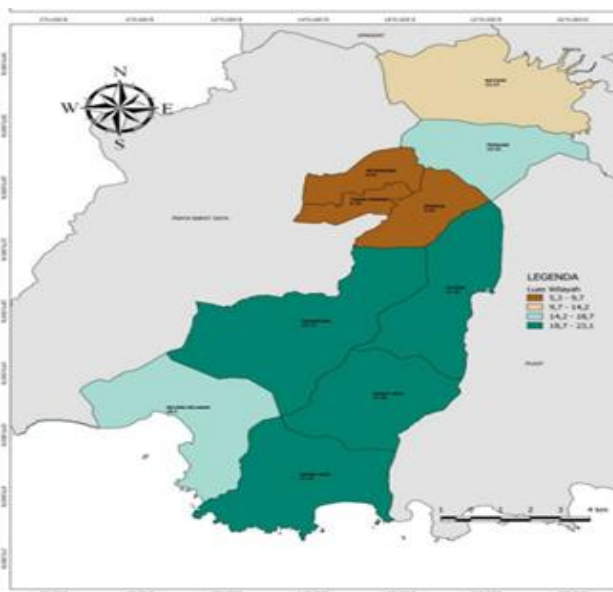
The focus of this strategy is to minimize internal problems. Quadrant IV: In this condition, it is an unfavorable situation because it faces various internal threats and weaknesses.

Result and Discussion

Overview of Research Locations

Batujai Village has a dam which is the largest dam in Central Lombok which is located in Batujai village. Construction began in 1977 and was completed in 1982. The construction of this dam as an irrigation facility in the agricultural areas of Penujak, Setanggor, Darek, Ungga, Ranggagata, and around Praya Barat District, Central Lombok Regency with an area of 3,350 ha as seen in Figure 1 (Sulistiyono, 2016).

Previously, rice fields in the area were rain-fed rice fields. With the development of the environment around the reservoir and changes in land use in the upper reaches of the river, the benefits of the dam to irrigate the rice fields are decreasing day by day to an area of 2,426 ha, also due to the high sediment entering the dam.



(a)



(b)

Figure 1. Research sites: (a) Map of West Praya District; (b) Batujai Dam

The existence of this dam can also regulate the peak discharge of floods from 1,332 cubic meters per second to 764 cubic meters per second or can reduce flooding by 568 cubic meters per second so that bigger consequences can be avoided. With the development of the environment around the dam and changes in land use in the upper reaches of the river, the benefits of the dam for irrigating the rice fields are decreasing to an area of 2,426 ha, due to high sediment entering the dam (during operation of ± 35 years). With the development of the

environment around the dam and changes in land use in the upper reaches of the river, the benefits of the dam to irrigate the rice fields are decreasing day by day to an area of 2,426 ha, due to high sediment entering the dam (during operation of ± 35 years) (FGD, 2023).

Benefits of Water Hyacinth Plants for People in Batujai Village.

Water hyacinth plant is a plant that has the ability to grow very fast. The growth of water hyacinth in the

Batujai Dam is very fast, where the area of the 1,000 ha dam is covered by nearly 500 ha of water hyacinth plants. Based on the results of a search using a questionnaire involving 50 respondents consisting of a group of water hyacinth plant users and the general public around the Batujai dam, information was obtained that water hyacinth plants can be beneficial as follows the water hyacinth plant is useful as a craft material; the water hyacinth plant is useful as a raw; and material for medicine the water hyacinth plant is useful as medicine.

Plant water hyacinth as a weed

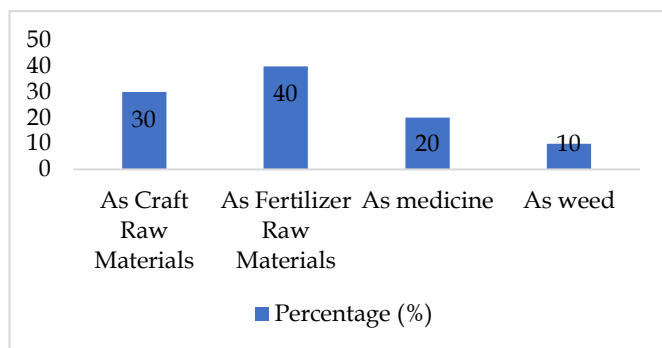


Figure 2. Benefits of Water Hyacinth Plants Based on Questionnaire Results

Figure 2 shows that the benefits of the water hyacinth plant according to the people around the Batujai dam are 40% stating that the benefits of the water hyacinth plant as a raw material for making fertilizer, 30% as raw material for crafts such as sandals, bags, and others, 20% as a medicine and only 5% of the people consider the water hyacinth plant a weed. This shows that the water hyacinth plant is a type of plant that can provide benefits for improving the economy and welfare of the people around the Batujai dam in particular and the people of Central Lombok in general. To achieve community expectations in the utilization of water hyacinth plants, attention from the government is needed to be able to collaborate with the community so that they can achieve common goals.

To follow up on the results of the questionnaire obtained, counseling activities were carried out

involving 35 people consisting of 19 heads of farmer groups in each hamlet, Head of Pokdarwis, Village Supervisory Board (BPD), 5 heads of hamlets and 9 communities around the Batujai dam, shown in Figure 3.

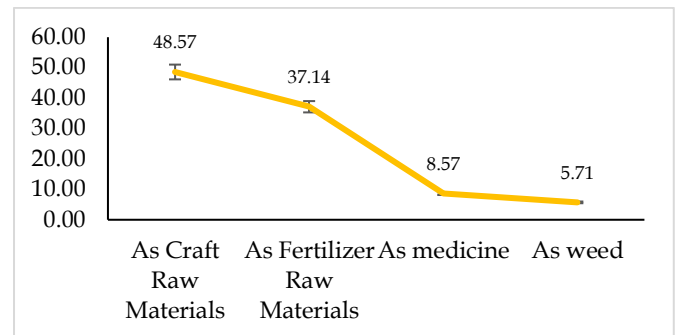


Figure 3. The benefits of water hyacinth plants based on counseling results

Figure 3 shows the benefits of the water hyacinth plant. According to the results of discussions at extension activities, 48.6% stated that water hyacinth plants could be useful as raw materials for crafts, 37.1% stated that they were used as raw materials for fertilizer, 3% stated that they were useful as medicine and 2% stated that they were weeds. From the results of the questionnaire and counseling data, it is hoped that it will provide a model that can be studied and implemented by the relevant government so that the maximum utilization of water hyacinth plants is carried out.

To follow up on information on the benefits of water hyacinth plants, a Forum Group Discussion (FGD) was carried out in order to be able to map the water hyacinth utilization model which later could provide benefits to the community (Asmare et al., 2020; Khabuchi, 2019). Forum Group Discussion (FGD) activities involved policy stakeholders, namely the Central Lombok Agriculture and Livestock Service, the River Basin Agency (BWS), the Central Lombok Cooperatives and UMKM Office, Praya Barat Sub-District Head, Batujai Village Head, Pokdarwis, Danramil and West Praya Police Chief. The actions of the local government in utilizing water hyacinth plants at the Batujai Dam.

Table 2. Plans for the use of water hyacinth plants in the Batujai dam

Utilization Type	Target	Help form
Water hyacinth plant become fertilizer	Beneficiary farmer groups	Capital, Provision of Softskill and Hardskill Training, Legality of business and census tools, Provision of Markets
Water hyacinth plants as raw materials for crafts	Beneficiary Farmers Group	Capital Business Legality, Provision of Softskill and Hardskill Training, Market Provision
Water hyacinth cultivation	Beneficiary Farmer Group and Community	Provide water hyacinth planting sites

Table 2 shows that there are 3 planned activities for the utilization of water hyacinth plants that will be carried out, namely the use of water hyacinth plants as fertilizer, as raw materials for crafts and the provision of places for cultivation or planting of water hyacinths outside the Batujai dam.

The relationship between the positive and negative impacts of water hyacinth on the environment in the dam on the mapping model for the use of water hyacinth plants

The water hyacinth plant is a type of plant that some people consider negative because it is a pest for the environment and threatens the habitat in the Batujai dam (Natasha et al., 2012) so that the Central Lombok government through the River Basin Agency (BWS) carried out grinding at the Batujai dam to remove the

water hyacinth plant, but some people, especially beneficiaries Water hyacinth plants reject what the government is doing because it has an impact on the absence of raw materials for making fertilizers and handicrafts. The positive and negative benefits of water hyacinth plants based on the results of the inepth interview, namely;

The water hyacinth plant is a plant that is considered a weed and disturbs habitats that live in reservoirs or dams (Harun et al., 2021; Robles & Martinez, 2021; Thamaga & Dube, 2018), but on the other hand the water hyacinth plant also has positive benefits. The benefits of water hyacinth plants for the environment as seen in Table 3. The negative impacts of water hyacinth on the Batujai dam can be seen in the Table 4.

Table 3. Positive impact of water hyacinth on the social, economic and ecological environment at the Batujai Dam

Positive impact	Benefit
Social Impact	
Cheap Tourist Attractions	The water hyacinth plant in the Batujai dam is a cheap tourist spot for the people around the Batujai dam
Research Object	The water hyacinth plant in the Batujai dam is useful for researchers who want to conduct studies on water hyacinth
Traditional medicine	Water hyacinth plants are efficacious as traditional medicine
Economic Impact	
Raw materials for handicrafts (sandals, bags, etc.)	Water hyacinth plants are useful as a raw material for making fertilizer that can be commercialized
Fertilizer raw materials (compost and POC)	Water hyacinth plant as an ingredient for making compost
As a business opportunity for the community	Water hyacinth plants can be used as business opportunities for the community
Ecological and Environmental Impacts	
Preserving the environment	Controlling and preserving the environment, absorbing metals (such as copper, lead from industrial and household waste), absorbing mercury, absorbing minerals from inorganic substances
Protector and shelter for small fish and other biota	As a source of fish feed, as a shade from direct sunlight to the bottom of the dam, absorbing fish waste and maintaining temperature

Table 4. Negative Impacts and Consequences of Water Hyacinth Plants on the Environment

Negative Impacts of Water Hyacinth Plants	Consequence
Increased Evaporation of Water	Too many water hyacinth populations will affect increased evaporation because the water hyacinth leaves are wide and grow fast.
Reduced Light Intensity and Dissolved Oxygen	Due to the excessive amount of water hyacinth, sunlight cannot penetrate the waters. In addition, the presence of water hyacinth also results in a decrease in dissolved oxygen in the water so that it can cause disruption of aquatic ecosystems.
Causing Siltation	Water hyacinth that has died will sink to the bottom of the waters, this will speed up the process of sedimentation or siltation. The result is that the capacity of lakes or rivers will be reduced and can increase the risk of flood disasters.
Disturbed Water Transportation	The fullness of the estuary of the dam causes disruption of transportation for fishermen fishing around the dam.
Bacteria Breeding Place	Certain bacteria can thrive in water hyacinth habitat. If left unchecked, this will likely cause disease outbreaks in humans.
Reducing Aesthetic Value	In addition to disturbing the flow or discharge of water, as well as aquatic life. Reservoirs, lakes or rivers that are covered by water hyacinth plants will lose their beauty value.

Based on Table 4, it shows that the positive impact of water hyacinth on the social, economic and environmental aspects is very beneficial and if it is

developed it will provide new business opportunities which result in an increase in people's welfare.

Table 5. SPSS analysis Determination Coefficient Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.295a	0.087	0.028	1.39394

a. Predictors: (Constant), Water hyacinth environmental impact, water hyacinth social impact, water hyacinth economic impact

Relationship of Negative and Positive Impacts of Water Hyacinth Plants on the Batujai Dam

Based on the output display of the SPSS model summary, the magnitude of R² is 0.87, meaning that 87% of the change/variation in the value of the dependent variable (Y) can be explained by variations of all independent variables (X1, X2, and X3), and the remainder (100% - 87% = 13%) is explained by other reasons outside the model.

Simultaneous Significance Test (Test F)

Based on the ANOVA test or F-test, the F-count value is 1.465 with a probability of 0.236; because the probability is greater than $\alpha = 0.05$ then Ho is accepted. This means that together (simultaneously) all the independent variables (X1, X2, and X3) included in the model, namely the positive impacts (social, economic and environmental) have no significant effect on the negative impacts of the water hyacinth plant in the Batujai dam.

Table 6. ANOVA^a Analysis of Negative Impact of Water Hyacinth

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.539	3	2.846	1.465	.236 ^b
	Residual	89.381	46	1.943		
	Total	97.920	49			

a. Dependent Variable: Negative Impact of Water Hyacinth

b. Predictors: (Constant), Water hyacinth environmental impact, water hyacinth social impact, water hyacinth economic impact

Based on Table 7 of the coefficients, it is known that the t-count value for X1 is -1.194 with a probability of 0.238; because the probability is greater than $\alpha = 0.05$ then Ho is accepted, meaning that the regression coefficient X1 is not significant or has no significant effect on the dependent variable (Y). The t-count value for X2 is -1.310 with a probability of 0.197; because the probability is greater than $\alpha = 0.05$ then Ho is accepted,

meaning that the regression coefficient X2 is not significant or has no significant (negative) effect on the dependent variable (Y). The t-count value for X3 is 0.443 with a probability of 0.000; because the probability is much smaller than $\alpha = 0.05$ then Ho is rejected, meaning that the regression coefficient X3 is significant or has a significant effect on the dependent variable (Y).

Table 7. The coefficients of the independent (independent) variables, you can use unstandardized coefficients or standardized coefficients.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.211	1.205		7.644	0.000
	Water hyacinth Social Impact	-.238	0.199	-0.177	-1.194	0.238
	The Economic Impact of Water Hyacinth	-.290	0.222	-0.200	-1.310	0.197
	Ecological Impact of Water Hyacinth	.083	0.187	0.065	.443	0.000

a. Dependent Variable: Negative Impact of Water Hyacinth

Analysis of the Benefits of Water Hyacinth Plants for the Environment Around the Batujai Dam

The IFAS matrix is used to find out how big the role of internal factors is in the company. The IFE matrix

shows the company's internal conditions in the form of strengths and weaknesses which are calculated based on ratings and weights as seen in Table 8.

Table 8. IFAS Matrix

Internal factors	Amount	Ratings	Weight	Weight x Rating
Strength				
Water hyacinth plants grow very fast	168	4	0.14	0.55
Water hyacinth plants do not need fertilizer	170	4	0.14	0.55
Water hyacinth plants have economic benefits	171	4	0.14	0.56
Water hyacinth plants are useful for tourism	165	4	0.13	0.54
Total Strength	674		0.55	2.20
Weakness				
The water hyacinth product is not yet known by the market	132	4	0.11	0.43
Very little promotion	136	4	0.11	0.44
HR skills are lacking	139	4	0.11	0.45
Local people are still not interested in water hyacinth-based products	145	4	0.12	0.47
Total Weaknesses	552		0.45	1.80
Total	1226		1.00	4.00
Difference				0.40

The EFAS matrix is used to determine the magnitude of the influence of external factors. The EFAS matrix describes the condition of business opportunities and threats which are calculated based on ratings and weights. Based on the IFAS and EFAS SWOT matrices, it is obtained that: IFAS difference = 0.40; Difference in EFAS=-0.13.

Determine the mapping model that can be used from the results of the IFAS and EFAS SWOT matrices.

The SWOT diagram in Figure 3 shows that the model that can be implemented by the government in utilizing the water hyacinth plant in the Batujai dam so that it does not disturb the environment and is used to open new businesses for the community is to implement a Diversification strategy (Quadrant 2). The diversification strategy is an expansion strategy by utilizing strengths (S) and threats (T) to achieve the expected goal of turning water hyacinth not into a weed

that can damage the environment but into a product with high selling value so that it can help the government reduce unemployment. For this reason, all related agencies must be able to play an active role in supporting and issuing policies on the use of water hyacinth plants in the Batujai dam.

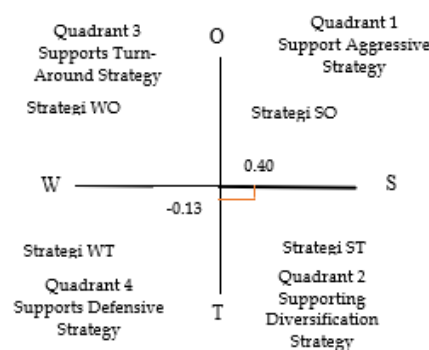


Figure 3. SWOT Analysis Diagram

Table 9. EFAS Matrix

External Factors	Amount	Rating	Weight	Weight x Rating
Opportunity				
Water hyacinth plant products are still new and have less competitors	121	4	0.13	0.51
Water hyacinth plant products are more affordable	126	3	0.13	0.40
Technological advances can be utilized in marketing	129	3	0.14	0.41
Total	536		0.57	1.32
Threat				
Consumer interest is still very lacking	131	3	0.14	0.42
The application of the law on consumer protection does not yet exist	123	3	0.13	0.39
Production equipment is still lacking	153	4	0.16	0.65
Total Threat	407		0.43	
Total	943		1.00	1.46
Difference				-0.13

Table 10. SWOT Matrix

OT	ST	Strength	Weakness
	<ol style="list-style-type: none"> 1. Water hyacinth plants grow very fast 2. Water hyacinth plants do not need fertilizer 3. Water hyacinth plants have economic benefits 4. Water hyacinth plants are useful for tourism 	<ol style="list-style-type: none"> 1. The market does not yet know the product of water hyacinth 2. Promotion is very less 3. HR skills are lacking 4. Local people are still not interested in water hyacinth-based products 	
<p>Opportunity</p> <p>The water hyacinth plant product is still new and lacks competition</p> <p>Products of water hyacinth plants are more affordable</p> <p>Technological advances can be utilized in marketing</p>		<p>SO</p> <ol style="list-style-type: none"> 1. The water hyacinth plant grows very fast, does not require fertilizer and is a new product that has less competitors 2. Water hyacinth plants have economic benefits at affordable prices 3. Utilization of water hyacinth marketing technology in tourism development 	<p>WO</p> <ol style="list-style-type: none"> 1. Increased promotion of water hyacinth products by taking advantage of low prices so that they dominate the market 2. Improving IT-based HR skills for Digital Marketing
<p>Threats</p> <p>Consumer interest is still lacking</p> <p>There is no law on consumer protection yet</p> <p>Production equipment is still lacking</p>	<ol style="list-style-type: none"> 1. Provide information about the advantages of water hyacinth plants, namely the price is cheap, raw materials are abundant, no fertilizer is needed to attract consumers' interest 2. Government policy support for consumer protection 3. Improvement of production equipment 		<p>WT</p> <ol style="list-style-type: none"> 1. Increased promotion of water hyacinth products and introduction of consumer protection laws 2. Improving the quality of human resources and developing production equipment

Based on the results of the SWOT analysis diagram that will be applied to the utilization of water hyacinth plants in the Batujai dam, namely; The ST strategy is in quadrant 2, namely supporting a diversification strategy where the SWOT results show that there are 3 strategies obtained based on the Strength and Treats results, namely: provide information about the advantages of water hyacinth plants, namely the price is cheap, raw materials are abundant, no fertilizer is needed in order to attract consumer interest; government policy support for consumer protection; and improvement of production equipment

Conclusion

Batujai Village is one of the closest villages to the capital of West Praya District, namely Penujak. one village with an area of 12.13 km² or 7.88% of the area of West Praya District. Search results with a questionnaire on 50 respondents about the benefits of water hyacinth plants. Water hyacinth plants are economically, socially, and ecologically beneficial. This shows that water hyacinth plants are beneficial to the environment around the dam. The SWOT results show that the mapping of the water hyacinth utilization model is that the government uses the water hyacinth plant in the Batujai dam so that it does not disturb the environment and is used to open new businesses for the community by implementing a Diversification strategy (Quadrant 2).

The diversification strategy is an expansion strategy by utilizing strengths (S) and threats (T), namely providing information about the advantages of water hyacinth plants, namely low prices, abundant raw materials, no need for fertilizer to attract consumer interest, government policy support for consumer protection, increased production equipment to achieve the expected goal of making the water hyacinth plant not a weed that can damage the environment but a product with high selling value so that it can help the government reduce unemployment. For this reason, all relevant agencies must be able to play an active role in supporting and issuing policies on the use of water hyacinth plants in the Batujai dam.

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Place acknowledgments, including information on grants received, before the references, in a separate section, and not as a footnote on the title page.

Author Contributions

The author's contribution to research activities are: Ir.Muhsin, M.Si (Head of Research) is in charge of coordinating with the research team during research activities, compiling preparation proposals, observing locations, collecting data, tabulating and analyzing data. Ir.Khairil Anwar, MM (Member 1) prepared proposals and preparations, observed locations, collected data, tabulated data. Yudi Hermawan, S.Hut., M.Sc (Member 2) prepared proposals and preparations, observed locations, collected data, tabulated data.

4. Students and field teams who assist in collecting primary and secondary data and documentation during research activities.

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Conflicts of Interest

The activities of this entire series of research were fully funded by Al-Azhar Islamic University's internal funds where the output of this research was in the form of a reputable National journal which was published in the Sinta 2 journal according to funds and contracts from the donor (UNIZAR) to researchers. The task of each researcher has been approved by both the chairman, members and students involved in this study. The results of the research will be submitted to the research monitoring and evaluation which time has been determined and the scope of the research is submitted to LPPM as the institution whose job is to carry out reporting on all research activities and service to the University. The research results will also be submitted to partners, namely Desa Batujai in the form of a research results module.

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