

Corporate Social Responsibility (CSR) and the Sustainability of Pt. Pertamina RU II Production in a Mangrove Area of the Pakning River

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Sustainable development is a collaboration between the government, private sector, and the community that is carried out with the concept of participation because the community is an entity that exists in an area that together seeks to realise social welfare. One of the problems faced in the environmental field is the problem of abrasion and damage to mangrove ecosystems along 46.5 km, and it is included in the critical category spread in five districts in Bengkalis Regency. Therefore through the Green Jewel Program, the local community cooperates with PT. Pertamina RU II Production of Sungai Pakning to rehabilitate mangrove forests. This type of research is Mixed Method, which is a collaboration between qualitative and quantitative approaches with an emphasis on qualitative and quantitative methods as a reinforcement of qualitative findings and data collection through interviews, surveys, observations, literature studies and focus group discussions (FGD). The findings of this study indicate that the level of sustainability of the Permata Hijau CSR Program of PT. Pertamina RU II River Pakning in the mangrove area in a multi-dimensional category is less sustainable. This is because of the Permata Hijau CSR program of PT. Pertamina RU II Sungai Pakning is still oriented towards the social and technological dimensions and ignores the ecological, economic and institutional dimensions.

Keywords: *Corporate social responsibility, development, sustainable and mangrove*



Background

Sustainable development is a collaboration between the government, private sector and the community. The scheme produces an increasing rate of development due to modernisation. In the scheme, the community has a role with the concept of participation because the community is an entity in an area that together seeks to realise social welfare. The role of the government and the private sector would not have been realised without the active role of the community.

Efforts from the private sector are also important in development and are often called Corporate Social Responsibility (CSR) and are widely known as *corporate social responsibility (CSR)*. CSR is often understood as the company's responsibility in doing business profitably while still prioritising environmental and social sustainability efforts (Serad, 2012). In the past, most companies focused solely on profit. Companies tend to overuse natural resources, resulting in conflict social with society and labour. Companies must be able to contribute to sustainable community development in an effort to increase corporate value, through communication with all stakeholders (owners/shareholders, customers, suppliers, employees, government, and local communities). Such communication covers environmental, social and economic issues; business management must always pay attention to complaints, requests and expectations of the community because the community has contributed, the company has a mutual obligation to the community environmentally, socially and economically.

The requirement for this company has been stated in Law Number 40 of 2007 concerning Limited Liability Companies, in article 74 it contains provisions concerning the company that runs its business activities in the field and related to natural resources to carry out social and environmental responsibility. Then the government issued Government Regulation Number 47 of 2012 concerning Social and Environmental Responsibility. The Riau Provincial Government has also issued Regional Regulation No. 6 of 2012 concerning Corporate Social Responsibility in Riau Province as the implementing regulation.

In response to the policy, every company in Indonesia, including PT. Pertamina RU II Production of Sungai Pakning, which runs its business related to energy and natural resources, also contributes to implementing policies through Corporate Social Responsibility (CSR) program. One of the objectives of the CSR program is to overcome various problems that arise in the area of PT. Pertamina RU II Production Pakning River. One of them is to overcome the problem of abrasion and damage to mangrove ecosystems. Abrasion that occurred in the Bengkalis Regency coastal area has occurred since 1988 until now. This event has been going on for a long time, and since then many settlements and community plantations have collapsed in waves, so they are categorised as critical areas.

In addition to the environment, fishermen believe that the impact of abrasion and mangrove damage affects the economic aspects, namely the amount of fish caught. Post-abrasion conditions certainly have an impact on fish life around the sea. Considering this, the fishermen feel they need alternatives or additional livelihoods by trying to explore the potential of fisheries and manage them. The high level of abrasion and the lack of public awareness of the preservation of mangroves make mangrove areas on the coast of Bukit Batu District more degraded. For this reason, PT. Pertamina RU II Sungai Pakning through findings in social mapping and the results of focused discussions with the local government and the community initiated the Conservation and Revitalisation Program for Mangrove Areas on the Bukit Batu coastline. This program focuses on efforts to improve the quality of the mangrove environment and conservation innovation through the selection of suitable mangrove seedlings in each region. The problem of mangrove areas can be identified as follows:

Table 1: Identification of problems in the Mangrove area of PT. Pertamina RU II Production Pakning River

No	Problems	Program	Activities	Goals
1	Damage to the mangrove area due to the abrasion level reaches 5 meters/year, so the residents' settlement has shifted by 200 meters to the ground to avoid abrasion.	Permata Hijau (the preservation of applied mangroves and the utilisation of mangrove ecosystems	Revitalisation and conservation of Mangrove areas with Hybrid Engineering technology	Mangrove Ecosystem Recovery
2	The destruction of mangrove areas due to human activity is the exploitation of mangrove wood, so 15.66 hectares of mangrove land in Pangkalan Jambi village is damaged.	through the cultivation of marine air brackish water-friendly technology)	Mangrove Education Center Pangkalan Jambi	Mangrove Education Center
3	Fish catches are low, sea fish catches declined drastically due to damage to the mangrove ecosystem, and local fish catches have not been processed optimally.		Tilapia Aquaculture Brackish water	Coastal Community Empowerment
4	Limited nature tourism in ring area 1 and 2 PT. Pertamina RU II Pakning River.			

5	Still, low science that the community has a provision of development and utilisation of mangrove areas.			
6	Limited capital and facilities and infrastructure of the village for the development and utilisation of mangrove areas			
7	Low level of community welfare around mangrove areas			

Source: Processed Data, 2019

This green Jewel Program originated from the initiative of the community to take PT. Pertamina RU II Production River Pakning to perform the rehabilitation of mangrove forests which conditions are very addictive. From the observation, the mangrove area is a few potentials that can be developed sustainably. As for the potential is: (1) There is a mangrove forest area that is potentially a natural tourism place; (2) There are some communities that are incorporated in the development group of mangrove ecotourism; (3) Capital support and facilities and infrastructure of CSR of PT. Pertamina RU II Pakning River; and (4) There is a social bond between the people in the area surrounding the mangrove area, seeing this, through the Corporate Social Responsibility (CSR) program as a form of corporate commitment to the State of maintaining the environment especially mangrove ecosystems. PT. Pertamina RU II Production Pakning River carried out an effort to revitalise and conservation of mangrove areas involving the community. Unfortunately, this effort has not been integrated because it needs collaboration with the central and local governments.

Research Methods

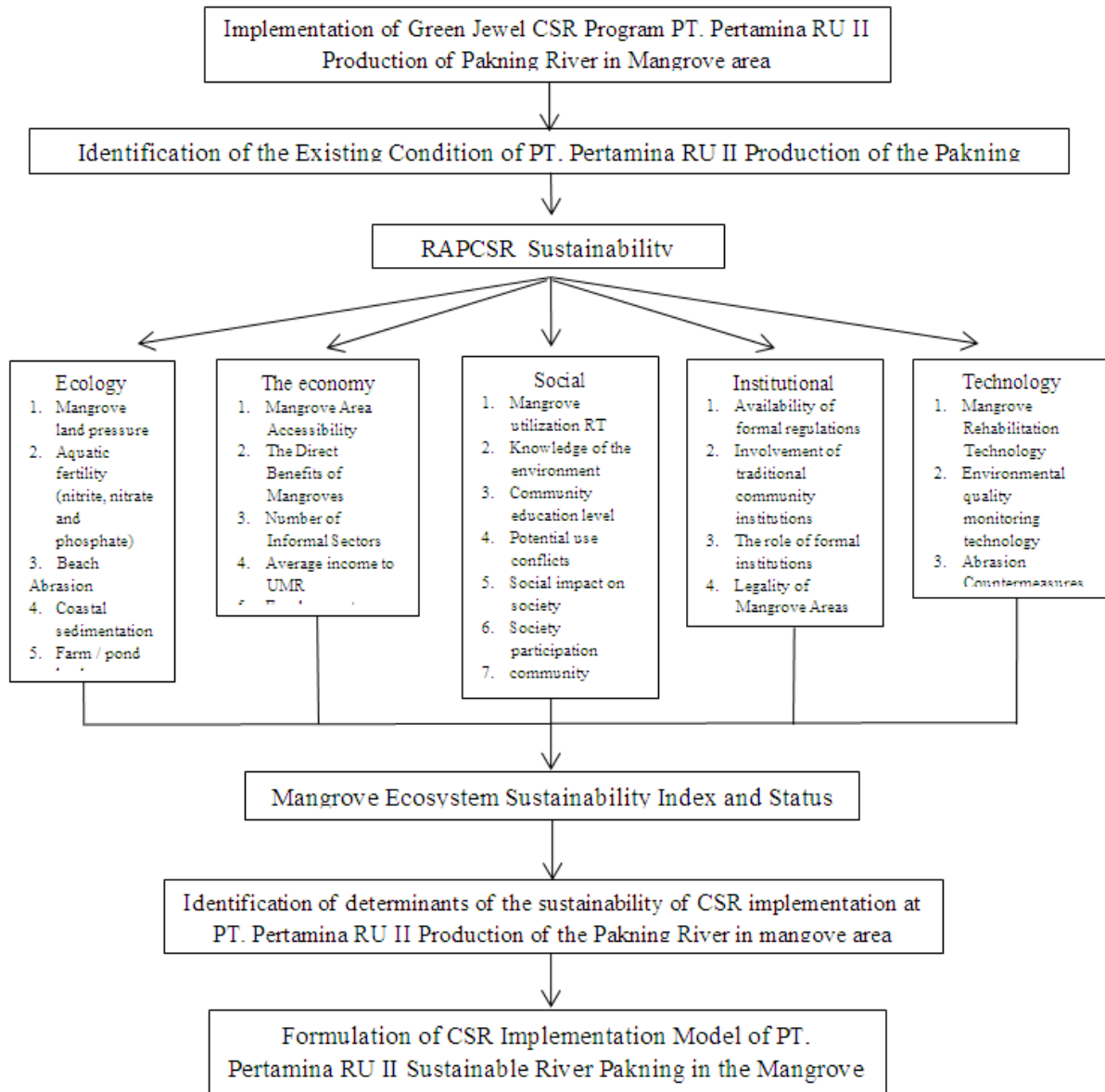
This type of research is the Mixed Method, which is a collaboration between qualitative and quantitative approaches. By Creswell (2010), this research will incorporate qualitative and quantitative mix-methods with an emphasis on qualitative methods and quantitative methods as a strengthening of qualitative findings. Taskhakkori and Teddlie (1998) conducted through the Participatory Rural Appraisal (PRA) approach to obtain high participation from the community (PRA) (Daniel, Darmawati, & Nioldalina, 2008). The qualitative method in this study uses a phenomenological approach that is rooted in the interpretive constructivism



paradigm—data collection through interviews, surveys, observations, literature studies and focus group discussions (FGD). The survey method uses a questionnaire technique consisting of attributes. The questionnaire technique developed is a closed system, which is a respondent to a question with answers options that have been available in relation to the socio-economic conditions of the surrounding community, hopes and desires, potential demand for utilisation of mangrove resources utilised by the community (limited tourism, education, research, aquaculture, forest standing, water biota, land fauna, and environmental services), community perception and PT. Pertamina RU II Production Pakning River to the management of mangrove areas and government management policy on the rescue of mangrove forest.

The framework of this research thinking is potential demand for utilisation of mangrove resources utilised by the community (limited tourism, education, research, aquaculture, forest standing, water biota, land fauna, and environmental services), community perception and PT. Pertamina RU II Production Pakning River to the management of mangrove areas and government management policy on the rescue of mangrove forest. The framework of this research thinking is:

Figure 1. Thinking Frameworks



Result and Discussion

a. Sustainability Status of Permata Hijau CSR Program PT. Pertamina RU II Production Pakning River

Analysis of CSR sustainability in the Mangrove Education Center Tourism Area of the Jambidan Tanjung Leban Base uses the Rapid Appraisal for Corporate Social Responsibility (RAPFSR modification) method. According to Kavanagh and Pitcher (2004), RAPFISH stands for Rapid Appraisal for Fisheries developed by the Fisheries Center, University of British Columbia Canada. RAPCSR is a method of analysis to determine the sustainability

(sustainability) of mangrove ecosystem management in a multi-dimensional manner based on the Multi-Dimensional Scaling (MDS) approach. MDS is a statistical technique that tries to carry out multi-dimensional transformations into lower dimensions (Fauzi and Anna, 2005). Whereas Bae et al. (2012) state that the basic concept of MDS is the process of determining the coordinates of the position of each object in a multi-dimensional map so that the distance between the mapping objects will correspond to the value of proximity in the input data. The measure of closeness between object pairs is in the form of similarity or dissimilarity.

The sustainability analysis procedure with the RAPCSR technique is carried out through several stages as follows: (1) Determination of the sustainable attributes of mangrove ecosystem management which includes five dimensions, namely: ecological, economic, social, technological and institutional dimensions; (2) Providing good/bad ratings on each attribute on an ordinal scale based on the sustainability criteria of each dimension; (3) Input the value/score of the assessment results of each attribute into the RAPCSR (RAPFISH) software, and run the RAPCSR; and (4) Compilation of indices and the status of sustainability of mangrove ecosystem management. The preparation of attributes of the management of mangrove ecosystem sustainability is based on five dimensions of sustainability, namely the ecological, economic, social, technological and institutional dimensions. Each attribute on each dimension is given a score based on the scientific judgment from the score maker. The range of scores ranges from 0, 1, 2 or depending on the state of each attribute, which is interpreted starting from bad to good. The following attributes and assessment criteria are in the table below:

Table 2: Rating attributes and criteria used in each dimension

1. Ecological Dimension				
Attribute	Score	Good	Bad	Assessment criteria
1. Mangrove land pressure	0; 1; 2	0	2	(0) No changes in the area of mangrove land; (1) Changes in the area of mangrove land naturally; (2) Mangrove land conversion takes place without regard to environmental functions (Santoso, 2012)
2. Aquatic Fertility (Nitrite, Nitrate and Phosphate)	0; 1; 2; 3	3	0	(0) Low (1) Is (2) High (Effendi in Putra, 2018)
3. Beach Abrasion	0; 1; 2	0	2	(0) No beach abrasion occurs (1) Coastal abrasion occurs but does not significantly affect the coastline

				(2) Coastal abrasion has occurred and has affected the coastline (Santoso, 2012)
4. Coastal sedimentation	0; 1; 2	0	2	(0) Mild to moderate 1-10 mg / cm ² / day (1) Moderate to severe 10-50 mg / cm ² / day (2) Very severe until catastrophic > 50 mg / cm ² / day (Son, 2018)
5. Use of pond / pond land	0; 1; 2	0	2	(0) Very suitable (1) Corresponding (2) It is not in accordance with (Santoso, 2012)
6. Use of the area for tourism	0; 1; 2; 3	3	0	(0) Overload (1) Low (2) Is (3) Optimal (Susilo, 2003)
7. Mangrove conservation	0; 1; 2	2	0	(0) There is no conservation, (1) There is conservation but is not well managed (2) There is conservation and well managed (Santoso, 2012)
2. Economic Dimension				
Attribute	Score	Good	Bad	Assessment criteria
1. Mangrove Area Accessibility	0; 1; 2	2	0	(0) Low: location is difficult to access with existing transportation facilities and infrastructure/facilities are very poor management (1) Medium: the location is accessible, and the management infrastructure/facilities are inadequate (2) High: the location is easily accessible, and the infrastructure/facilities of management are good (Santoso, 2012)
2. The Direct Benefits of Mangroves	0; 1; 2	0	2	(0) Low (number of people using <10% of households) (1) Medium (10% - 30% KK) (2) > 30% (Santoso, 2012)

3. Number of Informal Sectors	0; 1; 2	2	0	(0) Low: Job and business opportunities do not develop (1) Medium: business and work opportunities develop <30% (2) High: business and work opportunities develop > 30% (Santoso, 2012)
4. Average income to UMR	0; 1; 2; 3; 4	4	0	(0) Far down (1) Below (2) Same (3) Higher (4) Much higher (Susilo, 2003)
5. Employment	0; 1; 2	0	2	(0) <10% of residents work in mangrove areas (1) 10-30% of the population works in the mangrove area (2) > 30% of the population work in mangrove areas (Santoso, 2012)
6. Potential and number of tourist visits	0; 1; 2	2	0	(0) Low: tourist numbers <10,000 org / yr and low potential for tourism activities (1) Medium: the number of tourists 10,000-20,000 org / yr and the potential for moderate nature tourism activities (2) High: number of tourists > 20,000 org / yr and high potential for tourist activity (Santoso, 2012)
7. CSR Fund Support	0; 1; 2	2	0	(0) Low: There is no CSR funding support for mangrove management (1) Medium: there is CSR funding support for mangrove management, but the amount is small (2) High: there is CSR funding support for mangrove management and a large amount (Santoso, 2012)
8. Marketing of results	0; 1; 2	2	0	(0) Local market (1) National market (2) International market (Son, 2018)
3. Social Dimensions				

Attribute	Score	Good	Bad	Assessment criteria
1. Household users of mangrove wood	0; 1; 2	0	2	(0) <30% (1) 30 - 60% (2) > 60% of total RT
2. Knowledge of the environment	0; 1; 2; 3	3	0	(0) There is no (1) a little (2) Enough (3) Lots (Son, 2018)
3. Community education level	0; 1; 2; 3; 4	4	0	(0) Not completed in primary school (1) Elementary school (2) Middle School (3) High school (4) PT (Noveliana, 2016)
4. Potential use conflicts	0; 1; 2; 3	3	0	(0) High, > 10 times a year (1) Medium, 6-10 times a year (2) Low, 1-5 times a year (3) There is no conflict (Son, 2018)
5. Social impact on society	0; 1; 2	2	0	(0) Low: people don't feel and don't realise (1) Medium: people feel, but still low (2) High: the surrounding community feels the benefits of the mangrove area and is fully aware (Santoso, 2012)
6. Society participation	0; 1; 2	2	0	(0) Low: neighboring communities participating <20% (1) Medium: participating communities around 20 - 50% (2) High: surrounding communities participating > 50% (Santoso, 2012)
7. Community development	0; 1; 2	2	0	(0) There is no (1) Yes, it's not optimal yet (2) Optimal (Son, 2018)
8. Alternative non-	0; 1; 2	2	0	(0) There is no (1) There is, only one

mangrove ecosystem livelihoods				(2) Many, more than one
9. Have aesthetics	0; 1; 2	2	0	(0) Low: if there is one natural tourist attraction (1) Medium: if there are 2-3 natural attractions (2) Height: if there are > 4 natural attractions (Son, 2018)
4. The Institutional Dimension				
Attribute	Score	Good	Bad	Assessment criteria
1. Availability of formal regulations on mangrove ecosystem management	0; 1; 2	2	0	(0) There are no environmental management regulations available (1) Available but not understood by the public and employers and not well socialised (2) There are rules and are well socialised and understood by the public and entrepreneurs (Santoso, 2012)
2. Involvement of traditional community institutions	0; 1; 2	2	0	(0) There is no (1) Yes, it is not optimal (one adat institution) (2) Optimal, many traditional institutions (Son, 2012)
3. The role of formal institutions	0; 1; 2; 3	2	0	(0) There is no (1) There is, but does not play a role (2) Enough role (3) Very instrumental (Muliawan, 2016)
4. Legality of Mangrove Areas	0; 1; 2	2	0	(0) Low: the status of the mangrove area is unclear and there is no consistency in the RTRW (1) Medium: the status of the mangrove area is clear, and there is consistency in the RTRW (2) High: the status of the mangrove area is clear, and there is a consistent RTRW (Santoso, 2012)
5. Law enforcement	0; 1; 2	2	0	(0) Many cases cannot be resolved in a relatively long time (1) Only completed at the local level (2) Law enforcement is carried out properly (Santoso, 2012)

6. Local culture	0; 1; 2	2	0	(0) There is no (1) There is, but is not understood by the public and entrepreneurs and is not well socialised (2) There is and is well socialised and understood by the community and entrepreneurs
7. The existence of respected role models	0; 1; 2	2	0	(0) There is no (1) a little (2) Lots (Susilo, 2003)
5. Dimensions of Technology				
Attribute	Score	Good	Bad	Assessment criteria
1. Mangrove Rehabilitation Technology	0; 1; 2	2	0	(0) There is no, (1) Simple technology (not all technologies are applied), (2) All technologies are applied (Santoso, 2012)
2. Environmental quality monitoring technology	0; 1; 2	2	0	(0) There is no, (1) Simple technology (not all technologies are applied), (2) All technologies are applied (Santoso, 2012)
3. Abrasion Countermeasures Technology	0; 1; 2	2	0	(0) There is no (1) Simple technology, or very lack of abrasion prevention techniques (2) All abrasion prevention techniques are carried out along abrasion-threatened beaches (Santoso, 2012)
4. Fishing technology	0; 1; 2	2	0	(0) There is no (1) Simple technology, (2) All technologies are applied
5. Crab and fish culture technology	0; 1; 2	2	0	(0) There is no (1) Simple technology, (2) All technologies are applied
6. Technology transfer occurred	0; 1; 2	2	0	(0) Technology dependence on foreign parties in terms of knowledge and operation of the equipment. (1) Using technology that is still experimental and outdated technology

				(2) Utilisation of local technology Mardikanto, (2014)
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Source: Susilo (2003); Santoso (2012); Muliawan (2016); Noveliyana, (2016); Men (2018)

The results of the scores of each attribute are analysed by MDS to determine one or several points that reflect the sustainability position of the development of sustainable management which is studied relative to two reference points, namely the good and bad points. The definitive score is the mode score. The approximate score of each dimension is expressed on the worst scale (bad) 0% to the best (good) 100%. The score, which is the value of the sustainability index for each dimension, can be seen in the following table.

Table 3: Sustainability Status Category

Index Value	Category
0.00-25.00	Bad (not sustainable)
25.01-50.00	Less (less sustainable)
50.01-75.00	Sufficient (quite sustainable)
75.01-100.00	Good (very sustainable)

Sources: Fauzi and Anna (2005)

b. Leverage Analysis and Monte Carlo

Analysis to see which attributes are most sensitive contributes to the sustainability index, a sensitivity analysis (Leverage) is carried out by looking at changes in the root mean square (RMS). The greater the value of RMS, the greater the role of these attributes on the sensitivity of sustainability status (Kavanagh and Pitcher, 2004). To evaluate the effect of errors in the process of estimating management ordination values, Monte Carlo analysis is used. This analysis is intended to see the effect of errors to increase confidence in the results of the analysis. The difference in the results of the Monte Carlo analysis is small on the results of the analysis, showing that the impact of the error scoring is relatively small. If the value of the difference between the two analyses (Monte Carlo Analysis- Rap Analysis).

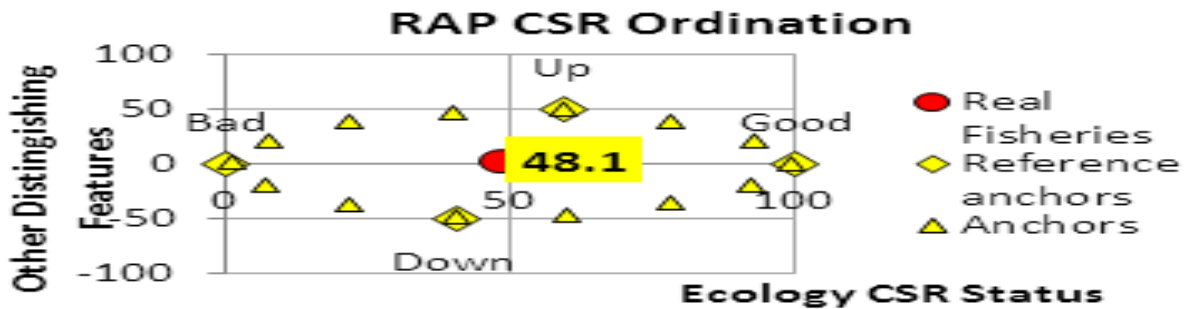
In the description of the table described above, it can be explained the sustainability status of each dimension, followed by its sustainability index, as follows.

1. Status of Sustainability in the Ecological Dimension

To determine the status of ecological dimension sustainability in the Permata Hijau CSR program PT. Pertamina RU II Pakning River Production attributes that are estimated to influence are (1) Mangrove land pressure; (2) Aquatic Fertility (Nitrite, Nitrate and Phosphate); (3) Coastal abrasion; (4) Coastal sedimentation; (5) Land use ponds/ponds; (6) Utilisation of

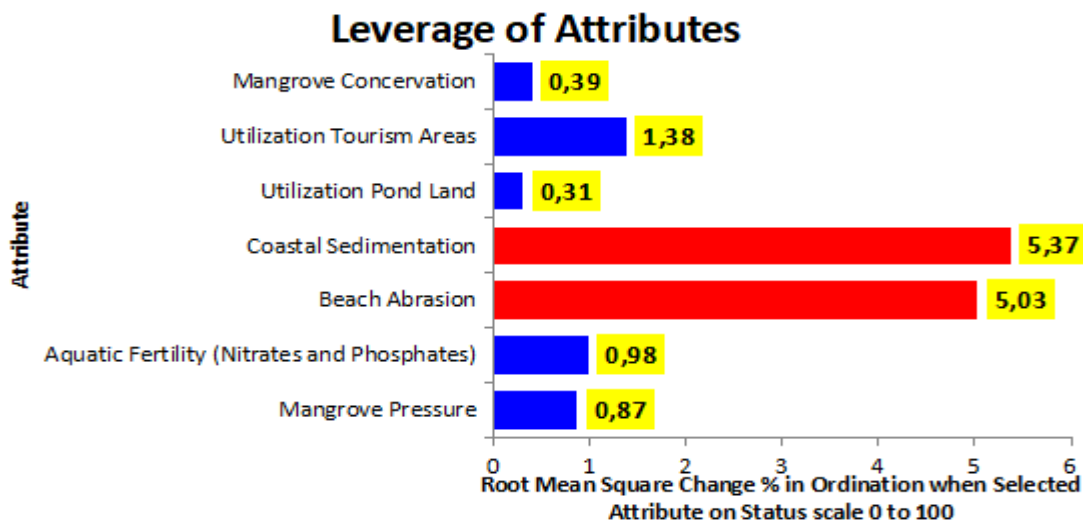
the area for tourism; and (7) Conservation of mangroves. The results of the analysis of the sustainability of the ecological dimension (RAPCSR) implementation of the CSR program in green gems of PT. Pertamina RU II Production of Sungai Pakning obtained a sustainability index of 48.1% or classified as less sustainable (<50).

Figure 3. Ecology Dimension Sustainability Index



In addition to obtaining a sustainability index, RAPCSR analysis also produces output in the form of leverage of attributes. Leverage analysis aims to see the sensitive attributes that influence the value of the ecological dimension of the sustainability index. Based on leverage analysis, two attributes are sensitive to the value of the ecological dimension of sustainability index, namely, (1) beach sedimentation (RMS = 5.37), and (2) beach abrasion (RMS = 5.03). These two attributes provide direction of interpretation that the condition of the mangrove ecosystem is strongly influenced by activities in the waters.

Figure 4. The role of each attribute of ecological dimension aspects expressed in the form of RMS (Root Mean Square) values



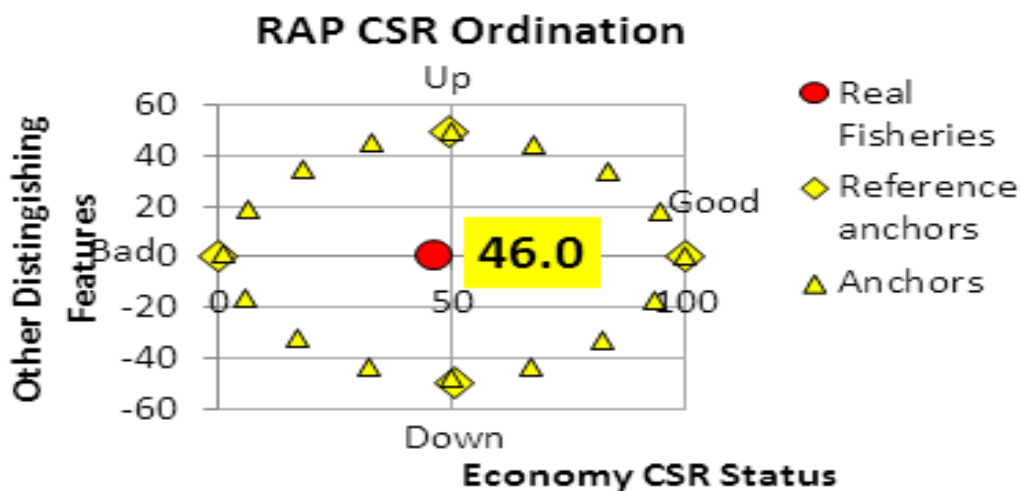
The figure above shows that the attributes of coastal sedimentation and coastal abrasion have high sensitivity, this is caused by the destruction of mangrove forests caused by illegal logging of mangrove wood for sale and use as fuelwood, wood and ceramic wood and charcoal. Yet according to Siburian and Haba (2016), mangroves can be a natural defence against extreme climates, tsunami disasters or large/high waves, preventing disasters in coastal communities, preventing erosion and coastal abrasion. The vulnerability of people's lives, especially fishermen, can be minimised due to the functioning of mangrove forests.

The length of the beach affected by abrasion is around 40 Km, with a length of the critical area of 11 Km and the average rate of abrasion 3-5 meters/year, until 2018 the settlement has shifted 100 meters inland to avoid abrasion. Efforts to handle this critical area from 2010-2015 are 3.9 km, with estimated funding of Rp 141 billion. Based on this description, to improve the sustainability status of the ecological dimension, it is necessary to pay serious attention to these sensitive attributes. However, it is also necessary to pay attention to other attributes, such as the use of tourist areas and the use of pond/pool land.

2. Sustainability Status Economic Dimension

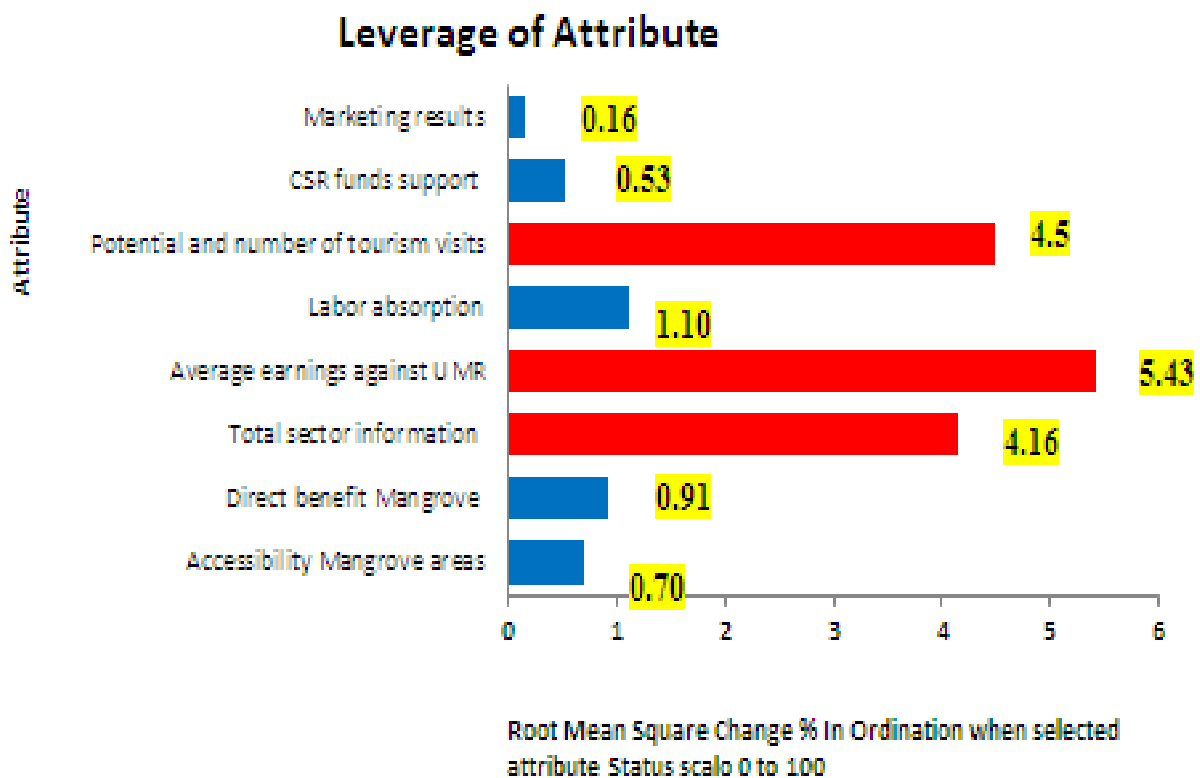
To determine the status of the economic dimension of sustainability in the Permata Hijau CSR program PT. Pertamina RU II Pakning River Production, attributes that are estimated to influence are (1) Accessibility of Mangrove Areas; (2) Direct benefits of mangroves; (3) Number of informal sectors; (4) Average income to UMR; (5) Absorption of labour; (6) Potential and a number of tourist visits; and (7) CSR funding support, and (8) Marketing of results. Based on the RAPCSR analysis in figure 25, the economic dimension of sustainability dimensions, the value is 46%. This value explains that the status of sustainability for the economic dimension is less sustainable (<50).

Figure 5. Sustainability Index of Economic Dimensions



To determine the sensitive attributes of the sustainability of mangrove ecosystems in the economic dimension, a leverage analysis is performed. Based on the analysis of leverage obtained three attributes that are sensitive to the value of the economic dimension of the sustainability index, namely, (1) the average income to the UMR (RMS = 5.43); (2) the potential and number of tourist visits (RMS = 4.51); and (3) number of informal sectors (RMS = 4.16). These three attributes provide direction for the interpretation that mangrove ecosystems have high economic value.

Figure 6. The role of each attribute of the economic dimension aspect expressed in terms of RMS (Root Mean Square) values



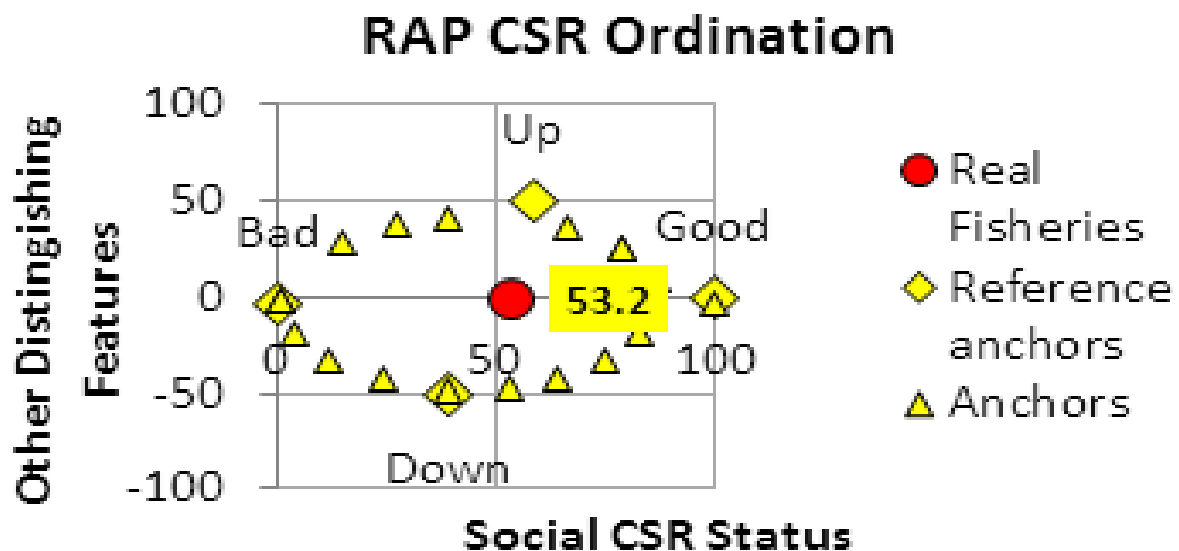
The attribute of average income to the minimum wage is quite high. Low community income, so it tends to encourage people to use mangrove forests to increase their income, namely by cutting down mangrove wood and selling it directly. In addition, to increase income, people open ponds for aquaculture without regard to the condition of the mangroves that occur. At the research location, in the village of Pangkalan Jambi, the community made a large enough amount of brackish tilapia ponds and fish ponds, and this will continue to grow along with the increasing income of the community for the cultivation of brackish water fish. In addition to fish farming, tourism development can be an alternative to increasing the income of communities around the mangrove area, thereby reducing the ecological pressure caused by fishing and illegal logging activities. This means that the economic dimension of mangrove

ecosystems can be developed one of them through the management of the tourism sector, at the research location, namely in the Village of Pangkalan Jambi and Desa Tanjung Leban, PT.

3. Sustainability Status Social Dimensions

To determine the status of the social dimension of sustainability in the Permata Hijau CSR program PT. Pertamina RU II Pakning River Production, attributes that are estimated to have an effect are (1) Households that use mangroves; (2) Knowledge of the environment; (3) Level of community education; (4) Potential conflicts of use; (5) Social impacts on the community; (6) Community participation; (7) Community empowerment; (8) Alternative non-mangrove ecosystem livelihoods; and (9) Having aesthetics.

Figure 7. Sustainability Index of the Social Dimensions



Based on the RAPCSR analysis in Figure 7, the social dimension sustainability index, the value is 53.2%. This value explains that the sustainability status for the social dimension is quite sustainable (51 - 75). This value illustrates that the social dimension has provided support for PT. Pertamina RU II Production Pakning River. Based on leverage analysis, one attribute that is sensitive to the social dimension sustainability index value is obtained, namely alternative non-mangrove ecosystem livelihoods (RMS = 2.15).

Figure 8. The role of each attribute of the social dimension aspects expressed in terms of RMS (Root Mean Square) values

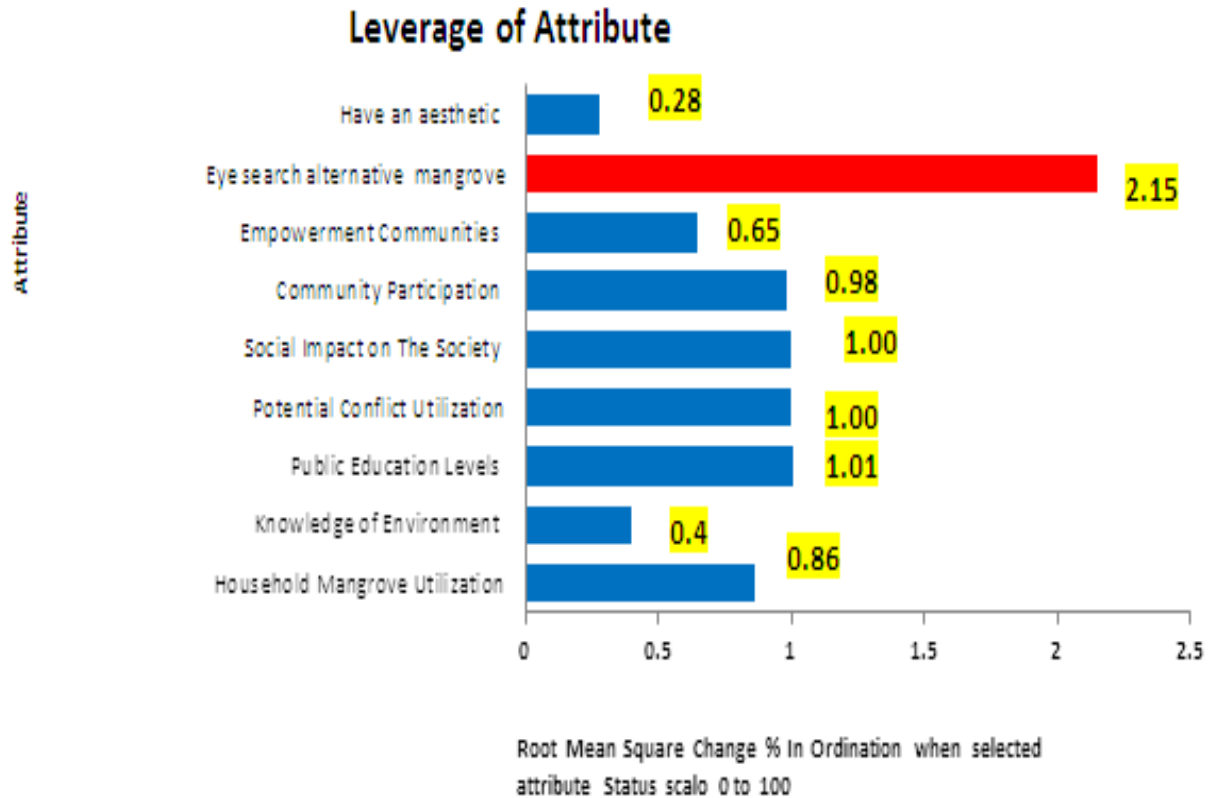
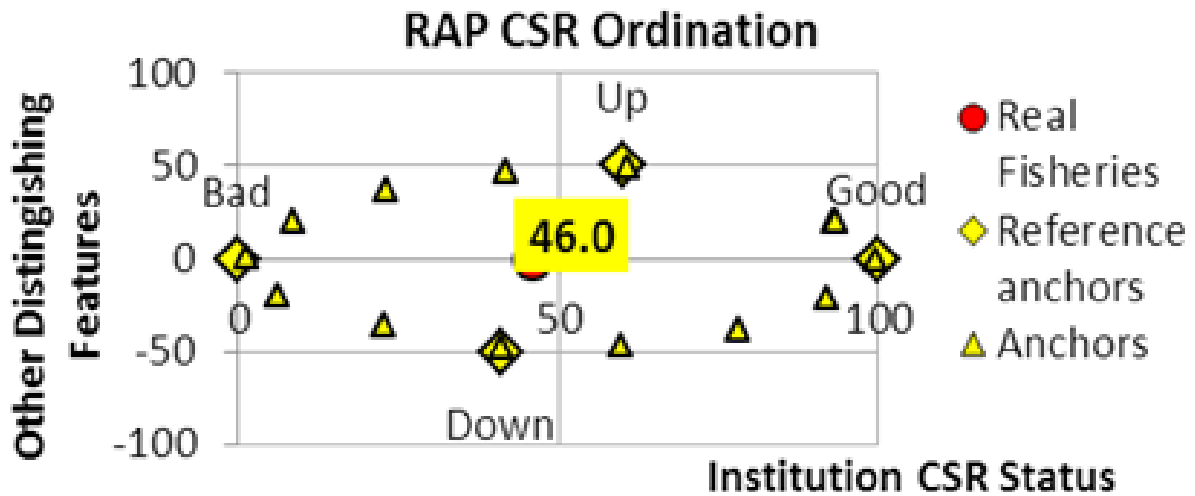


Figure 8 above shows the attribute that is classified as sensitive is alternative non-mangrove ecosystem livelihoods. Based on village monograph data and observations in the field, there are many alternative livelihoods in PT. Pertamina RU II Production Pakning River. Alternative livelihoods in the community are dominated by traders, oil palm farmers, rubber plantations, goat and chicken farmers. With the number of alternative non-mangrove ecosystem livelihoods, the pressure of the mangrove ecosystem from the social aspect decreases. This is what can support the sustainability of mangrove ecosystems because the community is not too dependent on their lives with mangrove ecosystems.

4. Sustainability Status Institutional Dimension

To determine the sustainability status of the institutional dimension of the Permata Hijau CSR program PT. Pertamina RU II Production of the Pakning River attributes that are expected to influence, namely: (1) Availability of formal regulations on mangrove ecosystem management; (2) Involvement of traditional community institutions; (3) Role of formal institutions; (4) Legality of Mangrove Areas; (5) Law Enforcement; and (6) Local wisdom.

Figure 9. Sustainability Index of Institutional Dimensions



Based on the results of the RAPCSR analysis in Figure 9 above, it shows that the sustainability value of the institutional dimension is 46%. This value explains that mangrove ecosystem management is less sustainable (<50). This needs to be considered because of the role of institutions in the management of mangrove ecosystems in the area of PT. Pertamina RU II Production Pakning River is essential. The role of the institution not only regulates natural resources but goes beyond that, namely regulating each stakeholder who has an interest in the mangrove ecosystem. This weak institutional role is evidenced by the absence of efforts from the local government to preserve damaged mangrove ecosystems, rehabilitation of damaged mangrove ecosystems is only done by the community and business world such as PT. Pertamina RU II Production Pakning River. In fact, it is important to have collaboration and coordination between sectors such as government, society and the business world. The results of the RAPCSR analysis for the institutional dimension obtained the most influential attribute on the sustainability of the institutional dimension, namely the legality of the mangrove area (RMS = 4.41).

Figure 10. The role of each attribute of the institutional dimension aspect expressed in terms of RMS (Root Mean Square) values

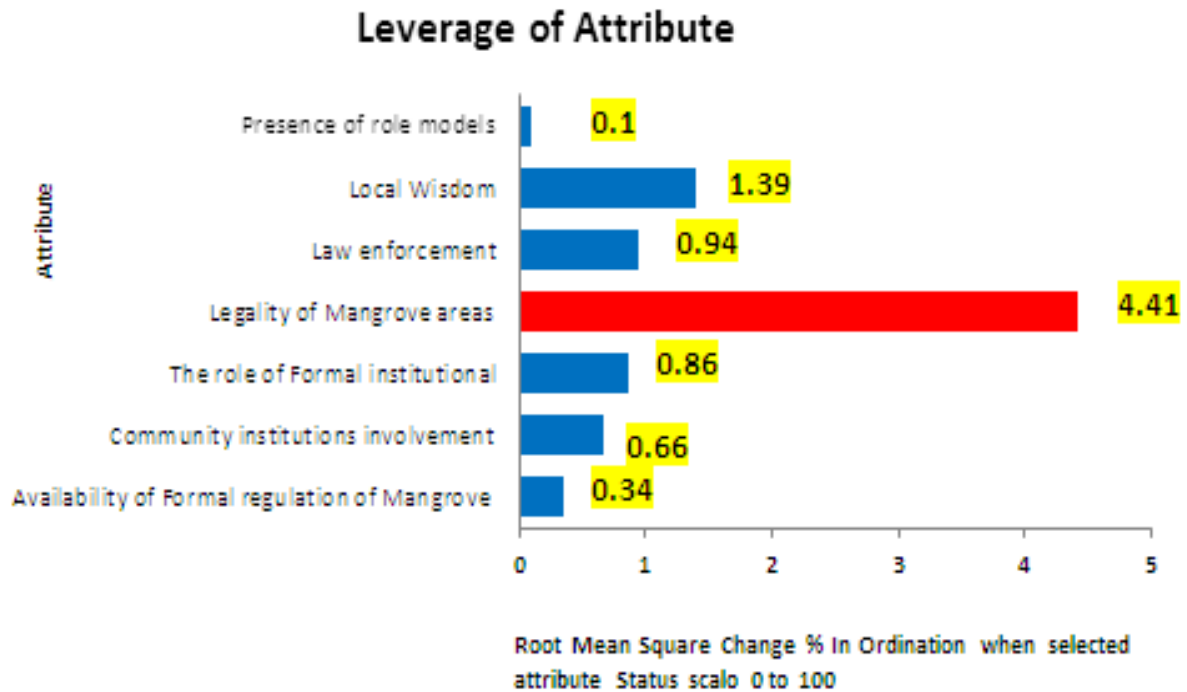


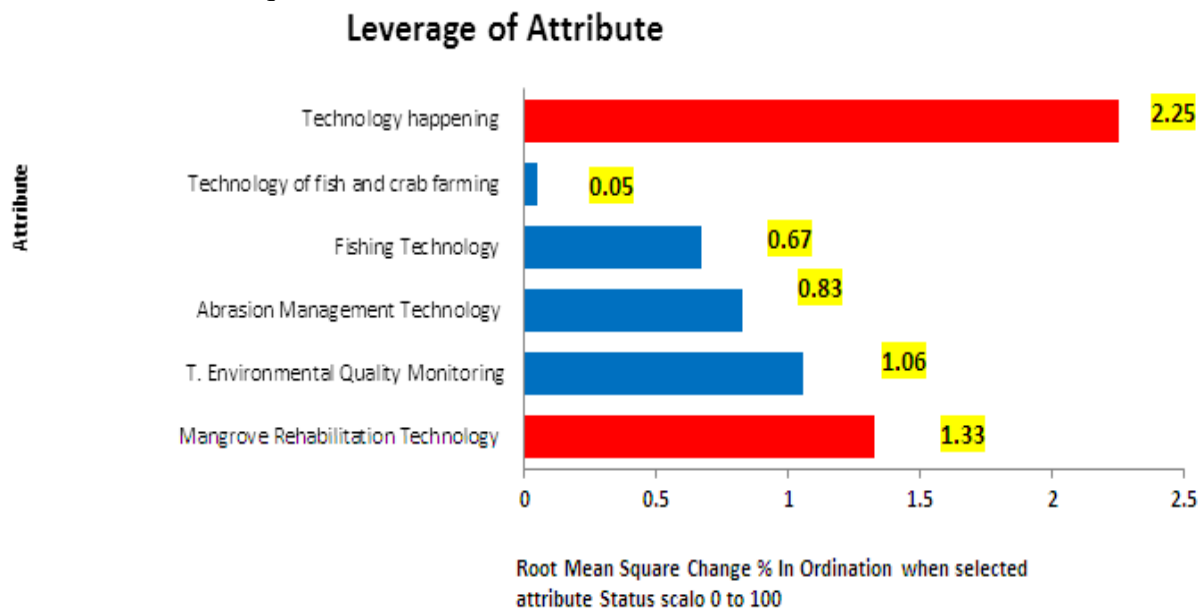
Figure 10 above shows the attribute that is classified as sensitive is the legality of the mangrove area. The legality of mangrove areas in the coastal areas of Bukit Batu District and Bandar Laksmana District is currently unclear. There are several illegal business activities in the mangrove area, such as shrimp ponds, crab ponds, fishponds, and even brackish water tilapia ponds. Legality in the form of Environmental Impact Analysis (EIA), Environmental Management and Monitoring Efforts (UKL-UPL), as well as Environmental Management Statement (SPPL), has never been issued by the Department of the Environment (DLH).

5. Sustainability Status Dimensions of Technology

To determine the status of the technological dimension of sustainability in the Permata Hijau CSR program PT. Pertamina RU II, Pakning River Production, attributes that are estimated to have influence are (1) Mangrove Rehabilitation Technology; (2) Environmental quality monitoring technology; (3) Abrasion control technology; (4) Fishing technology; (5) Fish and crab culture technology; and (6) Technology transfer occurred. Based on the RAPCSR analysis of the technological dimension sustainability index, the value is 52.1%. This value explains that the sustainability status for the technological dimension is quite sustainable (51-75). This value illustrates that the technology dimension has provided support for PT. Pertamina RU II Production Pakning River. Based on leverage analysis, two attributes are sensitive to the value of the technological dimension of sustainability index, namely, (1) technology transfer

occurred (RMS = 2.25) and (2) mangrove rehabilitation technology (RMS = 1.33). These two attributes provide direction of interpretation that mangrove ecosystems have high technological value.

Figure 11. The role of each attribute of the technological dimension expressed in the form of RMS (Root Mean Square) values



Based on observations and interviews with research informants, information is obtained that there has been a transfer of technology in the management of mangrove ecosystems in the Patronage Village of PT. Pertamina RU II Production Pakning River. The transfer of technology in question is that people used to cut down mangrove wood sometimes by using a chain saw tool to cut down mangrove wood that was supposed to use an axe. Likewise, with the size of wood that should be cut above 10 cm in diameter, but in reality, there is 5-7 cm in diameter. For mangrove rehabilitation techniques, PT. Pertamina RU II Production of Sungai Pakning has done it together with the community by making natural embankment with hybrid engineering technology that has been installed in 3 villages namely Pangkalan Jambi Village, Dompas Village and Sungai Pakning Village along 2,000 meters. The result has formed new land along the 21 meters. Based on this analysis, to improve the sustainability of the technological dimension, there needs to be serious attention from the government and PT. Pertamina RU II Production of the Sungai Pakning on these sensitive attributes. There are different habitat conditions at the location being evaluated so that it requires a different mangrove rehabilitation technology approach at each location.



Conclusion

The results of the MDS analysis were obtained three dimensions that have a sustained index value of 48.1% ecological dimension, the economic dimension of 46% and institutional dimension of 46%. Two fairly sustainable dimensions are 53.2% social dimension and technology dimension 52.1%. The results concluded that PT. Pertamina RU II River Pakning CSR Green Program is still oriented towards the social dimension and technology dimension, as well as ignoring the ecological dimension, economic dimension and institutional dimension. Furthermore, there is a further study on mapping the less sustainable dimensions—Permata Hijau CSR Program of PT. Pertamina RU II River Pakning from RAPCSR analysis results found that the ecological, economic and institutional dimensions are still neglected by PT. Pertamina RU II Pakning River. Therefore, it is hoped that the Permata Hijau CSR program can be sustainable, so it needs special attention to increase the status of these three dimensions through ecological mapping studies, economic mapping and institutional mapping to obtain recommendations of activities that must be done by PT. Pertamina RU II Sungai Pakning to improve the status of dimensions that is still less sustainable. so it needs special attention to increase the status of these three dimensions through ecological mapping studies, economic mapping and institutional mapping to obtain recommendations of activities that must be done by PT. Pertamina RU II Sungai Pakning to improve the status of dimensions that is still less sustainable. So it needs special attention to increase the status of these three dimensions through ecological mapping studies, economic mapping and institutional mapping to obtain recommendations of activities that must be done by PT. Pertamina RU II Sungai Pakning to improve the status of dimensions that is still less sustainable.



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