Jurnal Ilmu Sosial dan Pendidikan (JISIP)
Vol. 8 No. 2 Maret 2024
e-ISSN : 2656-6753, p-ISSN: 2598-9944
DOI: *10.58258/jisip.v7i1.6705/http://ejournal.mandalanursa.org/index.php/JISIP/index*

Study of the Social Return on Investment (Sroi) of the Komang Gold Social Innovation Program at PT Pertamina Patra Niaga Feul Terminal Lomanis

Ari Djanuar[1], Rina Ekawati[2], Farrah[3]
D4 Hospitality Management, Pertiwi University

Article Info
Article history:
Received : 05 February 2024
Published : 01 March 2024

Keywords:
SROI, Magrove Forest, CSR

Abstract
One of the CSR programs implemented by PT. Pertamina Patra Niaga is a mangrove forest conservationist. Social return on investment (SROI) is a framework used to measure and account for the value created by a program or initiative, beyond the financial value. SROI measures change that is relevant to the people or organizations that experience or contribute to it. The process of measuring the impact of the program using the SROI method consists of the Process of Equating Perceptions and Needs Assessment, the Process of Preparing Data Retrieval Tools, Tabulation, SROI Analysis and Calculation, Report Review and Making a Final Report. The results of the Impact Study of the Community Empowerment Program Based on Mangrove Ecosystem Management have SROI values for the Community Empowerment Program Based on Mangrove Ecosystem Management since 2019, namely 1.99, 1.96, 3.23, 2.07, 2.81. So the average SROI value from 2019 – 2023 is 2.4. With this value, it means that for every investment of IDR 1,- you get a benefit of IDR 2.4,-. So it can be said that the benefit value of the Community Empowerment Program Based on Mangrove Ecosystem Management is greater than the investment value, so it is hoped that the Community Empowerment Program Based on Mangrove Ecosystem Management will be able to answer community needs, support climate change disaster adaptation and support climate change disaster mitigation.

Corresponding Author:
Ari Djanuar
D4 Hospitality Management, Pertiwi University
Correspondence Email: ari.djanuar@pertiwi.ac.id

1. INTRODUCTION

The mangrove forest ecosystem is one of the natural resources of coastal areas which has enormous functions and benefits. There are at least 3 functions of the mangrove forest ecosystem that are beneficial to humans. These three functions are biological (ecological), physical and economic functions.

Biologically (ecologically), mangrove forest resources function as a nesting place for large birds, a natural habitat for many types of biota, a spawning ground, a nursery ground, and also as a feeding ground.) for fish and other marine biota. Physically, mangrove forests function to maintain stable coastlines, accelerate land expansion, protect beaches and river cliffs, process waste and prevent sea waves and sea water intrusion towards land. Economically, mangrove forests can be used as pond areas, places for making salt, wood and wood, as well as recreation areas.

Mangrove forests also have a very important role in reducing carbon emissions on earth. Carbon stock is the ability of mangroves to absorb carbon from the atmosphere and store it in leaves, stems, roots and sediment. The amount of carbon stock stored is influenced by the type of mangrove, density and fertility of the sediment. Planting patterns also influence the amount of carbon stock.

There are three districts in the south of Central Java that have mangrove forests, namely Cilacap district, Kebumen district and Purworejo district. Cilacap's mangrove forest is the largest compared to the other two districts. Mangrove forests in Cilacap can be found in

Karang Talun Kampung Laut. Meanwhile, the mangrove forests in Kebumen and Purworejo are on the beaches of Ayah and Demang Gedi.

Mangrove forests in Indonesia are the largest mangrove forests in the world, namely around 4.25 million Ha. However, the rate of destruction of mangrove forests in Indonesia is also very high. The area of mangrove forests in Indonesia is estimated to have decreased by 2.15 million Ha from the previous total (Candri et al., 2019). Efforts that can be made to preserve mangrove forests include rehabilitation.

One of the CSR programs implemented by PT. Pertamina Patra Niaga is a mangrove forest conservationist. This CSR program was previously called "Tongtong Stork Habitat Conservation Community Group", but was later changed in 2022 to "Agrobakgrove Synergy Program in Mangrove Groups". In 2023 the name of the program will be adjusted again to "Community Empowerment Program Based on Mangrove Ecosystem Management". All of these programs are a form of the company's commitment to managing natural resources and biodiversity.

After last year (2022) an impact study was carried out on the Agrobakau Synergy Program in Mangrove Groups for the 2019-2021 period, in 2023 an impact study activity will be carried out again with the same approach. This year's impact study covers program activities and stakeholders involved between 2019 - 2023. This was carried out as a form of communication about program sustainability to stakeholders. It is hoped that the results of the impact study in 2023 can become a reference for program managers, especially PT management. Pertamina Patra Niaga in increasing the efficiency and effectiveness of benefit absorption, mitigating risks and defining the next stages of the Community Empowerment Program Based on Mangrove Ecosystem Management.

SROI was chosen as an impact assessment method because this tool offers a participatory framework for measuring the impact or benefits (as social returns) felt by direct beneficiaries and other relevant stakeholders. Apart from that, the SROI tool can also be used by PT. Pertamina Patra Niaga to review the implementation and achievement of program objectives. Because SROI can be used in determining priorities for resources to be used (planning stage) and measuring program performance achievements, especially in uncovering success criteria and stakeholder expectations both qualitatively and quantitatively. (Nicholls: 2007; Toor and Ogunlana: 2010).

2. RESEARCH METHOD

Data Collection and Analysis

Several data collection techniques involving 20 respondents from 6 stakeholder groups were used to measure the impact of the Agrobakau Synergy Program, including:

1) Conduct in-depth interviews(in-depth interviews), namely to obtain data from stakeholders involved in implementing the Program;
2) Conduct surveys involving a number of stakeholders;
3) Carrying out documentation studies on various documents related to the Agrobakau Synergy Program.

Table1Data analysis method

SROI Report Points	***Data analysis***
Scope and stakeholders	Presented descriptively based on discussion with PIC TJSL and referring to a number of documents (planning and evaluation)
Impact mapping (TOC, Input, Output, Outcome)	Presented descriptively based on discussion with PIC TJSL and referring to a number of documents (planning and evaluation)

Proving the impact and giving it value	• It is explained by conducting a frequency distribution on the aspects in the questionnaire (perceived outcomes) so that it is known what percentage of respondents felt the outcomes (changes or benefits) of the program. • Outcomes are then evaluated using financial proxies
Impact Fixation (influence)	It is presented by conducting a frequency distribution on the aspects in the questionnaire (filter: deadweight, attribution, displacement, drop off) so that the adjusted value is known which shows how much value the changes that occur to stakeholders are caused by the program.

After the data has been collected and analyzed, the next step is to calculate the SROI ratio using the formula proposed by Scholten P., Nicholls, J., Olsen S. & Galimidi, B. (2006) as follows:

$$\text{SROI ratio} = \frac{\text{Present Value of benefits}}{\text{Value of investment}}$$

Technical Stages of Activities

The process of measuring program impact using the SROI method consists of several technical stages of implementation:

1. The process of equalizing perceptions and assessing needs. This process is a process to equalize perceptions between the research team and PT Pertamina Patra Niaga in order to agree on the scope of analysis and the theory of change (activities, outputs and outcomes that form) as a basis for determining data collection methods and instruments.
2. The process of preparing data collection tools. After agreeing on the program change theory, a strategy and data collection instruments from relevant stakeholders are then developed.
3. SROI tabulation, analysis and calculation. After the data is collected, tabulation and monetization are then carried out on the impacts felt by each stakeholder. The tabulation and monetization results are then analyzed so that they can be understood by both program managers and other report readers. The output of this stage is the preparation of a draft report.
4. Review report. The draft report was submitted to PT Pertamina Patra Niaga to obtain confirmation of the calculations that had been carried out.
5. Final report. The report was refined according to input and confirmation from PT Pertamina Patra Niaga to become the final report.

3. RESULTS AND DISCUSSION (12pt)

Social Return on Investment (SROI) Analysis

Table 2 SROI Ratio Measurement

No.	*Description*	*Dead weight*	*Attribution*	*Displacement*	*2019*	*2020*	*2021*	*2022*
Inputs								
1	PT Pertamina Patra Niaga Fuel Terminal Lomanis				**32,260,000**	**60,565,000**	**42,050,000**	**150,250,000**
Outcome Impact								
Karangtalun Mangrove Ecosystem								
1	Increased biodiversity	0%	0%	0%	1,125,000	1,950,000	7,200,000	8,000,000
2	Increasing the potential of vegetation to absorb GHG carbon	0%	0%	0%	870,666	17,075,205	39,385,200	39,134,784
3	Increasing the potential for vegetation in mitigating tsunami disasters	0%	0%	0%	-	-	-	-
4	Increase the size of the mangrove conservation area	0%	0%	0%	21,500,000	31,365,000	30,050,000	84,000,000
	Total				**23,495,666**	**50,390,205**	**76,635,200**	**131,134,784**
Gimangrove conservation group								
5	Availability of sufficient capital for gimangrove groups to start a mangrove nursery business	0%	0%	0%	-	-	-	-
6	The running of social entrepreneurship in mangrove nurseries which supports the group's financial independence	0%	0%	0%	5,150,000	10,801,500	16,037,500	21,105,000
7	Increasing the number of group assets that can support the mangrove nursery business	0%	0%	0%	-	-	-	51,000,000
8	Increasing group capacity in bird and habitat monitoring	0%	0%	0%	10,760,000	10,650,000	-	-
	Total				**15,910,000**	**21,451,500**	**16,037,500**	**72,105,000**
Owners of rice fields have no productive value								

9	Rice fields have productive value as mangrove nursery locations	0%	0%	0%	-	-	-	-
	Total				-	-	-	-
Group of housewives contributing media for planting mangrove seedlings								
10	Growing participation of housewives in mangrove conservation efforts	0%	0%	0%	-	-	-	-
	Total				-	-	-	-
Mothers of Gimangrove members								
11	Increasing the skills of women members of the Gimangrove group in making processed food products from mangrove fruit	0%	0%	50%	-	9,275,000	6,000,000	7,625,000
	Total				**-**	**9,275,000**	**6,000,000**	**7,625,000**
Fishermen are members of the mud crab cultivation business group								
12	Improved skills in running a joint business cultivating mud crabs	0%	0%	25%	-	-	-	-
	Total				-	-	-	-
PT Perhutani								
13	PT Perhutani's performance targets were met in protecting and maintaining the mangrove ecosystem in the Cilacap area	0%	0%	0%	21,500,000	31,365,000	30,050,000	84,000,000
	Total				**21,500,000**	**31,365,000**	**30,050,000**	**84,000,000**
	Total Outcomes				**60,905,666**	**112,481,705**	**128,722,700**	**294,864,784**
	Compound rate [P (1 + i)^n] – P				3,319,359	6,130,253	7,015,387	16,070,131
	Total PV Outcome				64,225,025	118,611,958	135,738,087	310,934,915
	Total PV of investment				32,260,000	60,565,000	42,050,000	150,250,000

SROI ratio	**1.99**	**1.96**	**3.23**	**2.07**

Based on table 9, it is known that the SROI value of the Community Empowerment Program Based on Mangrove Ecosystem Management since 2019 is 1.99, 1.96, 3.23, 2.07, 2.81. So the average SROI value from 2019 – 2023 is 2.4. With this value, it means that for every investment of IDR 1,- you get a benefit of IDR 2.4,-. So it can be said that the benefit value of the Community Empowerment Program Based on Mangrove Ecosystem Management is greater than the investment value.

From table 9 it can also be seen that 69% of the program benefits are felt by the mangrove ecosystem. Meanwhile, another 31% of the benefits were felt by PT Perhutani, rice field owners, women who were members of the mangrove group, mangrove crab cultivation business groups and women who contributed to the media for planting mangrove seeds. In order, the percentage of benefits received by each stakeholder is as follows: the Karangtalun mangrove ecosystem gets 41% benefit, the mangrove group gets 28% benefit, PT Perhutani Cilacap gets 23% benefit, rice field owners get 5% benefit, women who are members of the Gimangrove group get 2% benefit, the mangrove crab business group gets 0.4% benefit and the women who contribute to the media for planting mangrove seeds get 0.2% benefit.

Triple Loop Learning

Based on dialogue with a number of stakeholders, there are a number of key factors that influence the success of the Community Empowerment Program Based on Mangrove Ecosystem Management:

1. Involvement of partners (third parties) in the process of assisting program target groups. The involvement of experienced partners is sufficient to help the company, in this case the Community Development Officer (CDO), in implementing community development principles and ensuring the program is implemented using a project management approach.
2. Involvement of government stakeholders (DLH Cilacap, BKSDA, PT Perhutani, Subdistrict Government) means that the program can be synergized with regional government development targets. Apart from that, the program also received the necessary support from the government, such as permission to use PT Perhutani's land for conservation activities, the status of the gimangrove group as an official conservation group in Karangtalun.
3. The emergence of a local hero from the program, in this case the figure of the mangrove group leader, encourages new initiatives that generate involvement and support from other residents.
4. Fulfilling supporting infrastructure needs such as equipment, transportation and buildings can encourage acceleration and effectiveness in achieving program performance. This also increases ownership of group assets which is very useful for the sustainability of the group and its activities.
5. Achieving an increase in the knowledge and skills of program beneficiaries is sufficient to influence the achievement of the change targets set by the program.
6. The formation of social entrepreneurship such as mangrove nursery businesses and processed food production businesses made from mangrove fruit is an exit strategy that encourages the emergence of group independence.

There are several improvement plans that will be carried out to increase the benefits of the program, including:

1. Developing a mangrove downstream industry that is able to increase citizen participation while improving citizen welfare, such as mangrove crab businesses, mangrove processing businesses into fabric dye products and so on.
2. Developing government stakeholder engagement activities to maximize the value of program benefits, especially for government stakeholders
3. Develop educational activities for residents, especially those related to mangrove-based disaster mitigation.
4. Increasing the ability of mangrove groups to carry out advocacy so as to encourage the birth of public policies that support mangrove conservation activities.

Based on dialogue with program beneficiaries, there are a number of activities that have not been successful in the Community Empowerment Program Based on Mangrove Ecosystem Management:

1. Mangrove-based food processing businesses have not been able to become an alternative source of income. One of the contributing factors is that the mangrove fruit flour production process is not yet efficient, so production prices are very high. This results in the selling price of processed food products made from mangrove fruit flour being uneconomical. Especially if it is marketed targeting consumers around the sub-district. So the mangrove-based food processing business is currently only waiting for orders from consumers who are willing to pay according to the price offered by the group.
2. The mangrove nursery business currently still relies on PT Pertamina Patra Niaga's CSR program. The mangrove group has not yet found another big buyer. It is acknowledged that the skills of mangrove managers in identifying other large buyers and marketing mangrove seeds are still very weak.

There are several improvement plans that can be developed to overcome the 2 points above:

1. Conduct studies to find alternative, more efficient production processes and what technology can support increased efficiency in the production process
2. Increasing the capability of the Gimangrove group in terms of marketing mangrove seeds and implementing appropriate marketing technology.

ANALYSIS OF THE QUALITATIVE IMPACT OF THE PROGRAM AND ACHIEVEMENTS OF SOCIAL INNOVATION

Responding to Community Needs

Based on the results of in-depth interviews and FGDs conducted with mangrove group administrators, women who are members of mangroves, women who are contributors to the media for planting mangrove seeds, the following conclusions were obtained:

1. PT Pertamina Patra Niaga's support for the development of the mangrove nursery business has answered the needs of the Karangtalun community, especially the mangrove group, to be able to have an independent source of funding that supports the sustainability of mangrove conservation activities.
2. PT Pertamina Patra Niaga's support in the form of business capital and product packaging branding is also able to answer the needs of local residents, especially mothers who are in the phase of finding superior products that will sell well and have economic value.
3. Patra Niaga's support to the manrove group in the form of a boat outboard engine has answered mangrove's need to be able to have a boat outboard engine with a larger capacity. The outboard motor is needed to speed up the mobilization process for searching for mangrove seeds.

4. Patra Niaga's support to the Manrove group in the form of building a basecamp also answered the needs of the Gimangrove group, namely the need for storage for boat equipment, safety equipment and meeting rooms.

Disaster Response

Supporting Climate Change Disaster Adaptation

The mangrove ecosystem is closely related to climate change. The presence of healthy mangroves in coastal areas can increase the resilience of coastal communities to climate change and minimize the impact of natural disasters, such as tsunamis, storms and waves (adaptation function). Mangrove damage not only has an impact on increasing greenhouse gas emissions, but also on the resilience and welfare of coastal communities.

The threat of a tsunami in Cilacap Regency if a 7 - 8 SR earthquake occurs will be high in the coastal sub-districts around the epicenter. The sub-districts that will experience quite a large impact if a tsunami occurs are Kesugihan, Adipala, Maos, Kroya, Binangun, Nusawungu, South Cilacap, North Cilacap and Central Cilacap (Hilmi, et al: 2012). Based on the disaster risk assessment referring to hazard and vulnerability, if a tsunami threat occurs, the areas that need to be considered are North Cilacap and Adipala (Hilmi, et al: 2012). Karangtalun is one of the sub-districts in North Cilacap District which is categorized as medium for tsunami danger level (Yunus, et al: 2019).

The coastal green belt is a part of the mangrove forest that needs to be maintained. Its position bordering the beach or river bank has unique natural characteristics and has physical functions, one of which is as a support or buffer against wind, waves and currents originating from the sea. Mangrove ecosystem conservation activities which are part of the Community Empowerment Program Based on Mangrove Ecosystem Management really support adaptation to climate change disasters. Especially in increasing the resilience of the people in Karangtalun Village who live along the banks of the Tritih swamp against climate change. Especially in minimizing the impact of disasters such as tsunamis, storms and high tidal waves.

Supporting Climate Change Disaster Mitigation

Mangroves also participate in controlling climate change by acting as the world's lungs through absorbing and storing blue carbon (mitigation function). Mangrove forests have the potential to be an important asset in reducing greenhouse gas emissions. Mangrove plants absorb and store up to 20 times more than forest vegetation that grows on land. This is because almost 40% of tree biomass is carbon, which through the process of photosynthesis can absorb carbon dioxide from the atmosphere and convert it into organic carbon (carbohydrates). This organic carbon is stored in stems, leaves, roots, tubers, fruit and others. Damage and decline in the area of the mangrove ecosystem will encourage a large increase in the amount of carbon in the air which produces a greenhouse effect.

Mangrove conservation activities in the Community Empowerment Program Based on Mangrove Ecosystem Management really support climate change disaster mitigation. Especially in the absorption and storage of blue carbon. This program has the opportunity to fill the gap in the emissions reduction program.

Contribution to Sustainable Development Goals Targets

The Community Empowerment Program Based on Mangrove Ecosystem Management supports at least 2 Sustainable Development Goals (TPB), namely goal no. 13 regarding handling climate change and 14 regarding ocean ecosystems. The relationship between the Agrobakau Synergy Program and TPB goal no. 13 are:

1. The program has increased knowledge, raised awareness and the capacity of the community, especially members and mangrove groups, regarding mitigation, adaptation, and reduction of impacts related to climate change.
2. The program has gradually restored the existence of the mangrove ecosystem as a greenbelt. Mangrove planting activities every year since 2021 have produced mangrove environmental services as coastal protectors which contribute to the level of community resilience in facing climate change and natural disasters.
3. The program has gradually restored the blue carbon function of the Cilacap coastal ecosystem. Throughout 2022 - 2023, 18,000 mangrove seedlings have been planted in the Karangtalun waters covering an area of 1.8 hectares.

The relationship between the Community Empowerment Program Based on Mangrove Ecosystem Management and the objectives of TPB no. 14 is also quite relevant. The program is slowly being able to form a healthy mangrove ecosystem. A healthy mangrove ecosystem not only provides coastal protection services, but also plays a role in sustaining the availability of food sources in coastal areas. Protein consumption from fisheries (seafood) such as fish, shrimp and crab is closely related to the existence of mangrove forests as spawning grounds for marine biota. With mangrove planting activities from 2019 to 2023, local fishermen have experienced the abundance of shrimp, crabs and fish typical of the waters. The existence of this biota is easier to find than in the past.

Increasing the Capabilities of Community Organizations

Table 3 Komang Gold Increases the Capability of Community Organizations

Aspect	***Before***	***After***
Legal	Previously, mangrove groups were only informal groups	After program intervention, the status of the mangrove group increased to become a conservation group that received approval from the sub-district
Organizational structure	Previously, the mangrove group had no structure	After the program intervention, the mangrove group began to have an organizational structure and there was a division of tasks within it.
Number of Members	Previously, the mangrove group only consisted of 4 men	After the program intervention, the number of group members increased to 23 people consisting of men and women
Variety & Number of activities	Mangrove activities initially only revolved around planting mangroves	After the program intervention, the group carried out animal monitoring activities and arranged to borrow boats for fishing by fishermen
Group Cash	Previously, Mangrove did not have cash and group assets	After the intervention, the mangrove group had assets in the form of 2 motorboats, a monitoring post, a nursery house, and animal monitoring equipment. The mangrove group also runs a mangrove nursery business. Through this business the group has group cash.

Sharing Capabilities	The benefits of the existence of mangrove groups have not previously been felt by the community	• After intervention, the mangrove group sometimes received requests to borrow boats from a number of residents (fishermen) to fish. • After the intervention, the women who were members of Mangrove had group cash which was sometimes used to ease the burden on sick members or residents.

Increasing Social Cohesion

Table 4 Komang Gold Program Increases Social Cohesion

Aspects of Social Cohesion	*Conditions Before Social Innovation*	*Conditions After Social Innovation*
Joint Action	Before there was social innovation, residents' awareness of efforts to restore and preserve mangrove forest areas was very low	After social innovation, efforts to restore and preserve mangrove forest areas began to turn into a collective movement. This is proven by: **1.** Increasing the number of mangrove members **2.** The increasing number of residents (especially mothers) are involved in mangrove nursery activities **3.** Increasing the number of residents participating in mangrove seed planting activities **4.** Increasing the number of CSR activities other than VAT that support mangrove forest conservation activities in Karangtalun (SBI, Pangdam, Kaliyasa Complex, CIMB Niaga Cilacap)

5. CONCLUSION

Based on the description and discussion of the results of the Impact Study of the Community Empowerment Program Based on Mangrove Ecosystem Management, it can be concluded as follows:

1. The SROI value of the Community Empowerment Program Based on Mangrove Ecosystem Management since 2019 is 1.99, 1.96, 3.23, 2.07, 2.81. So the average SROI value from 2019 – 2023 is 2.4. With this value, it means that for every investment of IDR 1,- you get a benefit of IDR 2.4,-. So it can be said that the benefit value of the Community Empowerment Program Based on Mangrove Ecosystem Management is greater than the investment value.
2. 69% of program benefits are felt by the mangrove ecosystem and mangrove groups. Meanwhile, another 31% of the benefits were felt by PT Perhutani, rice field owners, women who were members of the mangrove group, mangrove crab cultivation business groups and women who contributed to the media for planting mangrove seeds. In order,

the percentage of benefits received by each stakeholder is as follows: the Karangtalun mangrove ecosystem gets 41% of the benefit, the mangrove group gets 28% of the benefit, PT Perhutani Cilacap gets 23% of the benefit, the rice field owner gets 5% of the benefit, the women who are members of the mangrove group get 2% benefit, the mangrove crab business group gets 0.4% benefit and the women who contribute to the media for planting mangrove seeds get 0.2% benefit.

3. Community Empowerment Program Based on Mangrove Ecosystem Management (supports at least 2 Sustainable Development Goals (TPB), namely goal no. 13 regarding handling climate change and 14 regarding ocean ecosystems.

Community Empowerment Program Based on Mangrove Ecosystem Management is able to answer community needs, support adaptation to climate change disasters and support climate change disaster mitigation

6. SUGGESTION

1. There is a need to develop a mangrove downstream industry that is able to increase citizen participation while improving the welfare of residents, such as mangrove crab businesses, mangrove processing businesses into fabric dye products and so on.
2. There needs to be activities involving government stakeholders in order to maximize the benefit value of the program, especially for government stakeholders
3. There is a need for educational activities for residents, especially those related to mangrove-based disaster mitigation.
4. There is a need to increase the ability of mangrove groups to carry out advocacy so as to encourage the birth of public policies that support mangrove conservation activities in Cilacap.
5. There is a need for studies to find alternative production processes that are more efficient and what technology can support increased efficiency in the production process
6. There is a need to increase the capability of mangrove groups in terms of marketing mangrove seeds and implementing appropriate marketing technology.

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