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ANALYSIS OF SOCIAL RETURN ON INVESTMENT FOR THE SEKAR ARUM DOMESTIC WASTEWATER MANAGEMENT SYSTEM IN MALANG

Dani Hermansyah
Universitas Brawijaya, Indonesia
Email: dani_hermansyah@student.ub.ac.id

ABSTRACT

The study focuses on the analysis of the Social Return on Investment (SROI) of the Sekar Arum Centralized Wastewater Treatment System (SPALD) in Malang, Indonesia. The research attempts to answer the main question regarding the economic, social, and environmental impacts produced by this program. The research methodology involved collecting both quantitative and qualitative data and consulting with stakeholders to understand their perceptions of the value and benefits of this initiative. The main findings suggest that investments in sanitation produce broad and multiplying benefits, including improved public health, reduced environmental pollution, and enhanced quality of life. The thesis delves into the significant implications of investing in sanitation and offers recommendations for increasing the effectiveness of the SPALD program. In conclusion, this thesis strengthens the understanding that investment in sanitation is a profitable and sustainable strategy that can help improve societal well-being and environmental health.

KEYWORDS *social investment; Sekar Arum SPALD; economic impact; social impact; environmental impact; sustainability*

INTRODUCTION

In realizing universal access to clean water and sanitation according to the sixth agenda of the Sustainable Development Goals (SDGs), central and regional governments face various challenges, including limited funding and involvement of all parties (inclusion) (Santoso, 2018). The Indonesian government shows a strong commitment to achieving the SDGs targets by adopting 169 SDGs indicators into the 2020 – 2024 RPJMN. According to Budiono (2012), challengelimited sources of financing require that the preparation of infrastructure provision programs to support the SDGs targets be carried out selectively and based on a priority scale, prioritizing the provision of basic clean water and sanitation infrastructure.Meanwhile, kThe success of implementing the program to provide

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clean water and sanitation infrastructure, as expressed by Hadimuljono (2022) and Tasruddin (2018), requiresynergy and collaboration between sectors, including central government, regional government, private sector and society.

In decidingpriority program, according to Cook et al., (1995) this can be done by measuring the magnitude of the impact of government programs through performance measurements. The benefits of performance measurement are also emphasized by Whittaker (1995) and Spekle and Verbeeten (2014), which states that Performance measurement provides a clear and objective view of the performance of public sector organizations, as well as strengthening accountability and transparency in the decision-making process. This opinion is in line with the stated objectives of the New Public Management Hood (1991), which states that there are explicit performance measurement standards one indicator of the success of bureaucratic reform.

One approach that can be used to assess performance by measuring the impact felt by the community regarding the implementation of a program is Social Return on Investment (SROI). As explained by Purwohedi and Gurd (2019),Hall and Millo (2018), and Cavalluzzo and Ittner (2004), Social Return on Investment is an innovative option that can be applied by government and non-government organizations to understand, measure and increase awareness of the impact of a program or policy. The use of SROI is considered capable of helping organizations obtain a broader picture of the impact resulting from investments of time, money and other resources.

Lawlor et al., (2008) concluded that analysis Social, environmental and economic impacts converted into real financial value can help organizations understand and manage the social, environmental and economic benefits of a program or activity more comprehensively. Thus, organizations can make better and more sustainable decisions. Apart from measuring the impact of a program, the SROI framework also includes monitoring and evaluation dimensions which aim to ensure that the outcomes and impacts of a program can continue to be felt by the community, as concluded by Thomas et al., (2015).

According to Cahyono et al., (2011) and Kospa and Rahmadi (2019), awareness and behavior of urban communities in managing domestic wastewater is still not good. Wastewater originating from household (domestic) activities contains various organic and inorganic materials which are one of the causes of environmental pollution. This pollution has an impact on various problems, both environmental and health related. Therefore, the provision of sanitation infrastructure in the form of a domestic wastewater management system is very much needed by the community.

Sekar Arum Domestic Waste Water Management System (SPALD) is a domestic waste water treatment facility located in Tanjungrejo Village RT 02 RW 10, Sukun District, Malang City. SPALD Sekar Arum was built through a Community-Based Sanitation program in collaboration with the Ministry of PUPR, Malang City PUPR PKP Service, Kayutangan Sacred Heart Church Foundation, and the local community. SPALD Sekar Arum started operating in December 2016. To date, SPALD Sekar Arum has been running for more than six years, and serves 138 Home Connections (SR). However, the effectiveness of the impact of SPALD Sekar Arum has not been measured, so stakeholders have not received actual information regarding the benefits produced by SPALD Sekar Arum.

Use SROI has been widely used in various previous studies, one of which is research conducted by Santoso et al., (2021),which examines the transformation of socio-cultural values in PT CSR. Bukit Asam Tbk through the Bukit Asam Industrial Center (SIBA) Batik Kujur Program. The SROI method is used to calculate the profits obtained from the program. The research results show that the SIBA Batik Kujur Program has succeeded in

increasing community capacity in creating positive change. The resulting impacts include increasing social cohesiveness, community ability to meet family needs, community capacity, and community pride in the history of their ancestors. The program has generated financial and social benefits, which in turn drives transformation for stakeholders and helps the company achieve its goals.

This research refers to a study conducted by Purwohedi and Gurd (2019), which used SROI to measure the effectiveness of sanitation projects in the form of Communal Based Waste Water Treatment Plants (IPAL Komunal) in Gresik Regency and develop an SROI calculator application. The study explains that there are 49 sanitation facility locations in Gresik Regency, data collection was carried out through interviews at four locations involving 75 households. The calculation results show that the SROI ratio for the Communal IPAL in Gending Village, Gresik is 1: 1.19, which means that every 1 Rupiah invested produces 1.19 Rupiah in the outcome value obtained.

The novelty of this research lies in the location and demographics of the research object which is in an urban area and serves residents who live around the river, in this case the Metro River. The demographics of Malang City, which is the second most populous city in East Java Province after Surabaya, with a population density of 7,806 people per square km, makes SPALD Sekar Arum very important in maintaining environmental quality and river cleanliness. Collaboration between the PUPR Ministry, Malang City PUPRPKP Service, Kayutangan Sacred Heart Church Foundation, and the local community makes SPALD Sekar Arum unique and has the potential to become a role model for implementing the principle of inclusion in the provision of sanitation infrastructure. The approach used in this research is a case study with a single case Yin (2018).

In the context of domestic wastewater management in Indonesia, research investigating the economic, social and environmental impacts related to sanitation infrastructure in the form of SPALD is still limited, especially in Malang City. This indicates that there is a lack of information regarding how domestic wastewater management systems affect people's lives and the surrounding environment. This method has the potential to provide a more comprehensive picture of the impacts generated by domestic wastewater management systems, but has not been widely explored by researchers. Furthermore, there are no studies that focus on analyzing the effectiveness of domestic wastewater management in Malang using the SROI approach.

The aim of this research is to analyze the effectiveness of the performance of the Sekar Arum Domestic Waste Water Management System (SPALD) using the performance of Social Return on Investment.

RESEARCH METHOD

Types of Research

This research was prepared using descriptive qualitative methods, to explore information and obtain a more detailed and detailed picture of the economic, social and environmental benefits produced by SPALD Sekar Arum in Malang. Miles et al., (2014)explains that the descriptive qualitative method is a research approach that aims to describe in detail the phenomena or events observed, both within the scope of individuals, groups and organizations, taking into account the social, cultural and environmental context.

Data collection techniques

The data collection techniques used in the SROI SPALD Sekar Arum analysis research in Malang City were interviews, observation, document analysis, and focus group discussions. Selection of appropriate data collection techniques will affect the quality and

validity of the data produced in the study. Therefore, researchers considered the characteristics and objectives of the research, as well as the data requirements needed in the SROI analysis of SPALD Sekar Arum in Malang City.

Data Processing and Analysis Techniques

Data Reduction

According to Creswell and Poth (2016) the data obtained during qualitative research is often very abundant and complex, therefore a process of simplifying and organizing the data that has been collected is needed so that it is easier to analyze or what is called data reduction.

Data Interpretation

Data interpretation is the process of understanding and explaining the meaning of data that has been collected, simplified, and organized through data reduction. In this section, the researcher will explain how the reduced data will be interpreted to understand the economic, social and environmental impacts of SPALD Sekar Arum

Data analysis

The data analysis method used to answer the problem formulation uses guidelines compiled by Nicholls et al., (2009) which defines SROI in six stages. The following is an explanation of the six stages of SROI.

Stage 1, Establishing the Scope and Identifying Stakeholders, includes: (1) Build scope, (2) Identify stakeholders, and (3) Decide how to involve stakeholders

Stage 2, Impact Mapping

In building an Impact Map researcher must be able to ensure that only outcomes that are important to those directly affected are measured and assessed. There are five steps when filling out an Impact Map: (1) Start on the Impact Map, (2) Identifying input, (3) Rate inputs, (4) Output clarification, and (5) Describe the outcomes

Stage 3: Proving Outcomes and Giving Them Value, includes: (1) Develop outcome indicators, (2) Collection of outcome data, (3) Determine how long the outcome will last, (4) Placing a value on the outcome

Stage 4: Building Impact (Impact)

Determine the significant impacts to be able to reduce the risk of overclaiming and the means that the analysis will be more credible, including the stages: (1) Deadweight and Displacement, (2) Attribution, (3) Drop off, and (4) Calculating Effects of Researcher Interventions

Stage 5: Calculating Social Return on Investment (SROI), includes stages: (1) Calculates net present value, (2) Calculating the ratio, (3) Sensitivity analysis, and (4) Payback time

Stage 6: Reporting, Using and Embedding, includes the stages: (1) Reporting to stakeholders, (2) Using the results, and (3) Convincing

RESULT AND DISCUSSION

Defining Scope and Identifying Stakeholders

Establish scope

Determining the scope is the initial stage of the Social Return on Investment analysis process, using data obtained from in-depth interviews, field observations and documentation studies, the description of the scope of the analysis is as follows:

1) Analysis Object

   The analysis was carried out on the Sekar Arum Domestic Waste Water Management System (SPALD), which functions to manage waste water originating from residential or household activities to maintain environmental quality and support community

health and welfare. SPALD Sekar Arum services include collection, treatment and disposal of waste water guided by standards set by the government.

2) Funding and contributions
In realizing SPALD Sekar Arum, funding sources come from various entities. The main source of funding comes from the central government through the PUPR Ministry, and is supported by regional government funds and contributions from user or beneficiary communities. These funding sources are then used to create domestic wastewater management facilities both at the socialization, construction and post-construction stages.
Apart from financing, there are in-kind contributions from community users or beneficiaries in the form of non-financial support such as providing volunteer labor, providing materials or equipment, as well as community participation in outreach, training and monitoring activities. Community contributions enable SPALD Sekar Arum to become more sustainable by actively involving various stakeholders in the domestic wastewater management process.
3) SPALD Sekar Arum Program Objectives
SPALD Sekar Arum aims to treat community domestic wastewater connected via house connections for communities in the Tanjungrejo sub-district effectively and efficiently before being discharged into water bodies (metro rivers) so as to prevent environmental pollution and improve community health and welfare. The implementation of this system also aims to realize sustainable sanitation and support the achievement of the 6th Sustainable Development Goals (SDGs), namely "Clean Water and Sanitation".
4) The intent of the SROI analysis
Social Return on Investment (SROI) analysis to analyze and assess the effectiveness of SPALD Sekar Arum by measuring the social, economic and environmental impacts resulting from investment in the SPALD Sekar Arum program. The effectiveness of SPALD Sekar Arum's performance can provide a better understanding of how value is obtained from investments, as well as the impact felt by various stakeholders.
5) Time period
The time period used in the SROI analysis in this research will cover the period from the beginning of the use of SPALD Sekar Arum until the time the research was conducted. This is intended to measure the short-term and long-term impacts of domestic wastewater investment and management.
6) Forecast or Evaluation
The approach used is "evaluation" to assess the impact that has been produced by SPALD Sekar Arum over the period of time that has passed, starting from the beginning of planning and construction until now. The evaluation approach measures the social, economic and environmental impacts that have been achieved, as well as assessing the effectiveness of investment and domestic wastewater management. An evaluation approach can also help identify areas that require improvement or changes in the management of SPALD Sekar Arum to achieve more optimal results.

Identify Stakeholders

Through in-depth interviews, observations and document studies, information was obtained that the stakeholders who contributed and were involved in realizing SPALD Sekar Arum, both directly and indirectly, consisted of the central government, regional government, private sector and the community. A summary of stakeholders and their roles in realizing the program is as follows:

Table 1. Identification of Stakeholders

No	Stakeholders	Role in the Program
1.	East Java Regional Settlement Infrastructure Center, Directorate General of Human Settlements – Ministry of PUPR	a. Provide rules and technical guidelines for the implementation of Domestic Wastewater Management b. Provide a budget to finance the construction of SPALD Sekar Arum c. Coordinate with local government and related agencies d. Monitoring and evaluating program implementation
2.	PUPRPKP Malang City Office	a. Conduct socialization of village level programs b. Preparing Field Facilitators (TFL) c. Monitor program implementation d. Coordinate at the village level e. Provide equipment technical support
3.	Tanjungrejo Village	a. Conduct sanitation awareness outreach to RT/RW and the community
4.	Hatikuskus Kayutangan Church Foundation	a. Provide availability of land use
5.	Field Facilitators (TFL)	a. Provide assistance in the preparation of Community Work Plans (RKM), Proposals, and LPJ for Program Implementation b. Conduct field technical assistance c. Carrying out community empowerment during implementation and post implementation
6.	KSM Sekar Arum	a. Develop development plans b. Organizing execution c. Prepare reports and accountability
7.	Sekar Arum SPALD user community	a. Contribute in the form of contributions (incash) and non-contribution contributions (inkind) b. Participate in using, maintaining, and supervising

Source: data processing

Impact Mapping

Preparing impact maps aims to ensure that only outcomes that are important to stakeholders are measured and assessed, then arranged in five steps, namely problems, inputs, activities, outputs and outcomes (Then et al., 2017).

Building an Impact Map

An impact map is a visual tool that helps to understand how problems, interventions are carried out and the conditions that are expected to occur due to these interventions are structured using a theory of change (Then et al., 2017). In the implementation of SPALD Sekar Arum, the impact map is described as follows:

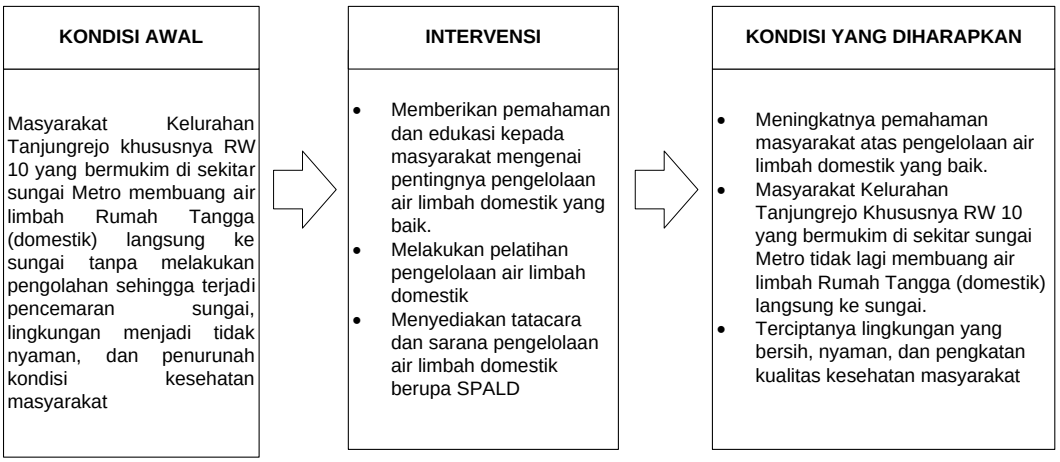

Figure 1. SPALD Sekar Arum Program Theory of Change

Identifying Input

Information regarding the resources (input) used to realize SPALD Sekar Arum was obtained through an in-depth interview process and documentation study. Input includes everything that is essential to ensure the program can be realized, operate and obtain the expected results involving both financial and non-financial resources. The following table summarizes the identification of these inputs:

Table 2. Input Identification

Stakeholder: Ministry of PUPR			
No	**Inputs**	**Utilization**	**Information**
1.	Socialization	Increase awareness and commitment to the importance of proper sanitation in Malang City	- Socialization to the Malang City Regional Government and PUPRPKP Service - Coordination of the fulfillment of Readyness Criteria - Educate the public about the importance of good domestic wastewater management.
2.	Training Activities	Increasing community competence in domestic wastewater management	- Training is given to Field Facilitator Staff (TFL) who accompany KSM SPALD Managers and the Community - Aims to improve competence and skills in managing and maintaining wastewater treatment systems.
3.	Government Budget/ Funds	- Labor costs	- The workforce involved in the project
		- Material Purchase	- The main and supporting materials used in the construction of SPALD
		- Equipment purchase or rental	- Equipment used in the construction of SPALD
		- Electrical energy costs and consumption	- Electricity, food snacks
		- Materials and Administration & Activity Accountability Reports	- Stationery, binding
Stakeholders: Malang City Government & Malang City PUPR PKP Service			
1.	Monitoring and Evaluation Activities	As quality control and evaluation of program implementation	- Ensure that implementation is according to plan and program results meet standard criteria, as well as providing direction for improvement if discrepancies are found
Stakeholders: KSM Sekar Arum			

1.	Land Availability	Land/construction site for SPALD Sekar Arum	- The 120m2 land is located on the edge of the Metro river, Sukun Village
Stakeholders: User Community			
1.	Community contribution	Inkind: - volunteer workforce - consumption for project activities Incash: - Monthly fees after SPALD is built	

Source: processed data

The data listed in the input table is obtained from information in the form of resources needed to run the Sekar Arum SPALD program and how they interact with each other. This helps in identifying how these resources are used to create the desired social, economic and environmental impacts.

Rate Inputs

Table 3. Assessing Input

No	Inputs	Quantity	Unit	Unit price (Rp)	Total cost (Rp)
1.	Socialization	5	Activity	1,000,000,-	5,000,000,-
2.	Training Activities	3	Activity	1,200,000,-	3.600.000,-
3.	Budget/Government Funds to build SPALD	1	Rupiah	400,000,000,-	400,000,000,-
4.	Community Contribution				
	- inkind	2	Activity	4,000,000,-	8,600,000,-
	- incash	60	Month	300.000,-	3,000,000,-
5.	Land	120m2	M2	700.000,-	84,000,000,-
6.	Monitoring and Evaluation	10	Activity	300.000,-	3,000,000,-
				Amount	**507.200.000,-**

Source: processed data

Output clarification

Output is a direct result of program intervention which is then obtained through various activities carried out in the program. A summary of the output of the SPALD Sekar Arum program is as follows:

Table 4. Output clarification

No	Inputs	output	Information
1.	Socialization	As many as ± 250 officials and the public participated in the outreach activities	Outreach activities to educate the public about the importance of good domestic wastewater management.
2.	Training Activities	As many as ± 20 KSM managers of SPALD participated in training activities	Improving community competence and skills in managing and maintaining wastewater treatment systems.
3.	- Government Funds (incash) - Community Contribution	1. Served 138 House Connections (SR) to the Wastewater Treatment Plant 2. The construction of 3 proper public MCK cubicles 3. The availability of playgrounds, sports and community activities	Government funds are used for the construction of SPALD Sekar Arum infrastructure, including providing the necessary equipment and materials as well as being used for workforce salaries.
4.	Monitoring and Evaluation	As quality control and evaluation of project implementation	Ensure implementation according to plan and project results meet implementation criteria, as well as provide recommendations for improvement

Source: processed data

Describe the outcomes

A summary of the outcomes achieved from the various outputs produced is as follows:

Table 5. Describe the outcomes

No	output	Outcomes
1.	Number of participants in outreach activities	1. Increased public awareness regarding the importance of good domestic wastewater management. 2. Changes in people's behavior in managing domestic waste, so that they do not dispose of domestic waste directly into the river. 3. Community support for the program and sustainability of SPALD Sekar Arum.
2.	Number of participants in training activities	1. Increasing community competence in managing and maintaining wastewater treatment systems. 2. Improved operational quality due to increased knowledge and skills. 3. Increasing community independence in managing waste water in their environment. 4. Increased efficiency which can have an impact on reducing operational costs.
3.	1. Served 138 House Connections (SR) to the Sekar Arum Wastewater Treatment Plant 2. The construction of 3 proper public MCK cubicles 3. The availability of playgrounds, sports and community activities 4. Availability of activity plan documents, SOP, and person in charge of SPALD Sekar Arum	1. Job creation from SPALD construction activities. 2. Increased business sales around SPALD. 3. Improving the quality of public health due to the reduction of diseases related to wastewater. 4. Improved environmental quality due to effective wastewater treatment and reduced pollution. 5. To become a place of learning about communal WWTP management for practitioners, students and the general public, thereby increasing knowledge and awareness about the importance of effective and environmentally friendly wastewater management. 6. Increases public comfort due to reduced odors and insects that are usually associated with untreated wastewater. 7. Increase the aesthetic value of the environment. 8. Avoid misuse of unused space. 9. Property values increase along with improvements in environmental quality. 10. Increased sustainability of river ecosystems due to reduced pollution 11. Increasing community participation and involvement in environmental management and community development.

Source: processed data

Proving Outcomes and Giving Value to Outcomes, Including:

Develop outcome indicators

Set specific indicators to measure each outcome that has been identified. The indicators aim to track and measure changes that occur as a result of the SPALD Sekar Arum intervention. A summary of SPALD Sekar Arum outcome measurement indicators is presented in the following table:

Table 6. Develop outcome indicators

No	Outcomes	Result Indicator	Measurement Proxies
1.	Increased public awareness regarding the importance of good domestic wastewater management.	The level of public knowledge and understanding of the importance of domestic wastewater management	The costs of socialization increase public knowledge

No	Outcomes	Result Indicator	Measurement Proxies
2.	Changes in people's behavior in managing domestic waste, so that they do not dispose of domestic waste directly into the river.	Reducing the number of people who throw domestic waste directly into rivers	Costs saved from cleaning and handling water pollution.
3.	Community support for the program and sustainability of the SPALD Sekar Arum program.	Number of people participating in the SPALD Sekar Arum program	The monetary value of the time and resources invested by society.
4.	Increasing community competence in managing and maintaining wastewater treatment systems.	The number of training or workshops attended by the community and the level of knowledge they have achieved.	Monetary value of increased skills and competencies.
5.	Improved operational quality due to increased knowledge and skills.	Evaluation of wastewater treatment system performance.	The monetary value of improving water quality.
6.	Increasing community independence in managing waste water in their environment.	Number of community initiatives in wastewater management.	Monetary value of increased independence and efficiency in waste management.
7.	Increased efficiency which can have an impact on reducing operational costs.	Comparison of operational costs before and after program implementation.	Save operational costs.
8.	Job creation from SPALD construction activities.	Number of jobs created during SPALD construction.	The total salary or wages paid to workers.
9.	Increased business sales around SPALD.	Increase in income or sale of businesses around SPALD.	Total increase in sales or revenue.
10.	Improving the quality of public health due to the reduction of diseases related to wastewater.	Reducing the number of cases of diseases related to waste water.	Health costs that can be saved.
11.	Improved environmental quality due to effective wastewater treatment and reduced pollution.	Improvement of environmental quality indicators such as BOD, COD, TSS in processed water	The monetary value of improving environmental quality.
12.	To become a place of learning about communal WWTP management for practitioners, students and the general public, thereby increasing knowledge and awareness about the importance of effective and environmentally friendly wastewater management.	Number of visits or training held at SPALD Sekar Arum.	Monetary value of knowledge and skills acquired by participants.
13.	Improving people's comfort by reducing odors and insects associated with untreated wastewater.	A survey on people's perceptions of smells and insects in their surroundings.	The monetary value of the increased quality of life and convenience.
14.	Increase the aesthetic value of the environment.	Survey on public perception of the beauty and cleanliness of the environment.	The monetary value of increasing the neatness and beauty of the environment.
15.	Avoid misuse of unused space.	Evaluation of land use before and after the construction of SPALD.	Monetary value of increased effective land use.
16.	Property values increase along with improvements in environmental quality.	Changes in property market prices around the SPALD area.	Monetary value of people's willingness to pay
17.	Increased sustainability of river ecosystems due to reduced pollution	Improvement of river water quality indicators such as BOD, COD, TSS.	The monetary value of improving water quality and river ecosystems.

No	Outcomes	Result Indicator	Measurement Proxies
18.	Increasing community participation and involvement in environmental management and community development.	Total community participation in environmental management and community development activities.	Monetary value of increased community participation and involvement.

Outcome data collection

Through FGD (Focus Group Discussion) with beneficiary communities conducted in several stages. The total FGD participants were 94 family representatives in the SPALD Sekar Arum operational area, preceded by the presentation of the objectives and discussion topics to the participants. Discussion participants were given the opportunity to ask questions to better understand the purpose of the FGD so that various experiences regarding waste water management that had been carried out by SPALD Sekar Arum could be explored. Participants were involved directly to discuss the influence of the SPALD Sekar Arum program on their lives, including behavior changes, increased awareness, and support for the program.

Collecting data from measurement proxies of the nature of "willingness to pay" to explore the extent of the community's willingness to pay as a form of assessing indicators for the results of the SPALD Sekar Arum program. This data is measured through a series of questions and discussions specifically designed to evaluate the extent to which the community is willing to appreciate the impact of the program.

Table 7. Outcome data collection

No	Outcomes	Indicator	Measurement Proxies	Acquisition of Data and Information
1.	Increased revenue	1. Jobs created 2. Increased sales from community business activities	- Value of wages received from work (monthly) - Business sales increase value (monthly)	- Data on the value of wages received from work (monthly) was obtained from FGD activities - Data on the increase in business sales (monthly) was obtained from FGD activities
2.	Improving the quality of SPALD operationalization	Avoidable repair costs	- Amount of repair costs avoided (monthly)	- After operating for ± 5 years, in September 2021 there was a need to repair the pipeline connecting to the WWTP
3.	Improving the quality of public health	Reducing diseases caused by waste water	- Assess avoidable health costs	- There is a reduction in the number of diseases related to wastewater such as diarrhea, typhus, cholera and worms
4.	Awareness raising, Behavior change, and Community support for SPALD	Number of households willing to connect with SPALD	- The amount that must be spent to organize socialization (annual)	- Communities who understand the benefits of SPALD are willing to connect with SPALD as long as they meet technical criteria such as adequate elevation and distance to the drainage pipe network.
5.	People who socialize more often	Number of hours spent in society	- Costs residents are willing to pay (monthly)	- The community uses the space above the WWTP for socializing, exercising and playing for children
6.	Become a place of learning about communal WWTP	Number of people conducting studies on SPALD	- Costs residents are willing to pay (monthly)	- There is data on comparative study visits to SPALD Sekar Arum which was administered by KSM in the Guest Book and Documentation
7.	Environmental quality improvement	The amount of reduction in river water pollution	Cost of treating polluted water per cubic meter	- There is data on the estimated results of water treatment
8.	Increase people's comfort	The availability of playgrounds, sports and community activities	Costs that residents are willing to pay	- Data acquisition was carried out through FGD
9.	Increase the aesthetic value of the environment	Improvements to environmental aesthetics	Costs that residents are willing to pay	- Data acquisition was carried out through FGD

10.	Improve the river ecosystem	The volume of wastewater treated by SPALD Sekar Arum	Costs required to treat domestic wastewater	- Data acquisition was carried out through FGD

Determine how long the outcome will last

The duration of the effect or impact that is being measured from the results of the intervention in the form of SPALD Sekar Arum describes the impact duration, aiming to find out how long the impact resulting from the intervention can last and provide benefits to stakeholders. A summary of how long outcomes can last is as follows:

Table 8. The length of the outcome can last

No	Outcomes	The length of the outcome lasts	Information
1.	Increased revenue	1 year	This source of income is temporary and directly related to the duration of SPALD Sekar Arum construction.
2.	Improving the quality of SPALD operationalization	50 years	Following the useful life of SPALD Sekar Arum
3.	Improving the quality of public health	50 years	Following the useful life of SPALD Sekar Arum
4.	Awareness raising, Behavior change, and Community support for SPALD	50 years	Following the useful life of SPALD Sekar Arum
5.	People who socialize more often	50 years	Following the useful life of SPALD Sekar Arum
6.	Become a place of learning about communal WWTP	50 years	Following the useful life of SPALD Sekar Arum
7.	Environmental quality improvement	50 years	Following the useful life of SPALD Sekar Arum
8.	Increase people's comfort	50 years	Following the useful life of SPALD Sekar Arum
9.	Increase the aesthetic value of the environment	50 years	Following the useful life of SPALD Sekar Arum
10.	Improve the river ecosystem	50 years	Following the useful life of SPALD Sekar Arum

Source: processed data

The outcome in the form of “increased income” was mostly generated from the construction process of the Sekar Arum Domestic Wastewater Management System (SPALD). The reason why this outcome lasted only one year is because this source of income is temporary and directly related to the duration of Sekar Arum SPALD construction.

Placing a value on the outcome

A monetary value is assigned to each identified outcome. Various approaches are used, such as market prices, standard or reference prices, ratios, and values according to the type of outcome and available data. This process ensures that the social and environmental impacts of the intervention in the form of SPALD Sekar Arum can be measured and appreciated in monetary terms, helping to communicate the benefits of the intervention more effectively and understandably. A summary of the outcome assessment is presented in the following table:

Table 9. Outcome Assessment

No	Outcomes	Indicator	Outcome Value (Rp)
1.	Increased revenue	- Value of wages received from work - Increasing the profit of the food business - Increasing material business profits	120,000,000 54,000,000 60,000,000
2.	Improving the quality of SPALD operationalization	- Avoidable repair costs	59,328,000
3.	Improving the quality of public health	- Assess avoidable health costs	108,432,000
4.	Awareness raising, Behavior change, and Community support for SPALD	- The value that must be spent to organize socialization	150,600,000
5.	People who socialize more often	- Costs that residents are willing to pay	21,084,000
6.	Become a place of learning about communal WWTP	- Costs that residents are willing to pay	259,200,000
7.	Environmental quality improvement	- Cost of treating polluted water per cubic meter	89,237,376
8.	Increase people's comfort	- Costs that residents are willing to pay	43,488,000
9.	Increase the aesthetic value of the environment	- Costs that residents are willing to pay	32,616,000
10.	Improve the river ecosystem	- Costs that residents are willing to pay	21,744,000
		Amount	**1,019,729,376**

Building Impact

Deadweight and Displacement

Deadweight is a change that is expected to occur even without intervention (Nicholls et al., 2012). In this analysis, the value of each outcome is obtained by only assessing the benefits of SPALD Sekar Arum. Meanwhile, Displacement is the negative impact of an intervention, for example, whether the intervention causes a decrease in results elsewhere. A summary of Deadweight and Displacement is shown in the following table:

Table 10. Deadweight and Displacement

No	Outcomes	Deadweight	Displacements
1.	Increased revenue	0%	0%
2.	Improving the quality of SPALD operationalization	0%	0%
3.	Improving the quality of public health	0%	0%
4.	Awareness raising, Behavior change, and Community support for SPALD	0%	0%
5.	People who socialize more often	0%	0%
6.	Become a place of learning about communal WWTP	0%	0%
7.	Environmental quality improvement	0%	0%
8.	Increase people's comfort	0%	0%
9.	Increase the aesthetic value of the environment	0%	0%
10.	Improve the river ecosystem	0%	0%

Attribution

Attribution is the proportion of impact that can be attributed to other parties. A summary of the proportion of impact that can be attributed to other parties is shown in the following table:

Table 11. Attribution

No	Outcomes	Attribution	Information
1.	Increased revenue	0	
2.	Improving the quality of SPALD operationalization	0	
3.	Improving the quality of public health	0	
4.	Awareness raising, Behavior change, and Community support for SPALD	0	
5.	People who socialize more often	0	
6.	Become a place of learning about communal WWTP	0	
7.	Environmental quality improvement	0	
8.	Increase people's comfort	0	
9.	Increase the aesthetic value of the environment	0	
10.	Improve the river ecosystem	0	

Drop Off

The impact of the intervention in the form of SPALD Sekar Arum will decrease over time. The drop-off concept provides a realistic and accurate picture of how long the positive impact of the intervention in the form of SPALD Sekar Arum can last. The summary of the SPALD Sekar Arum drop-off program is as follows:

Table 12. Drop off

No	Outcomes	Drop off	Information
1.	Increased revenue	73%	After the first year the increase in income decreased significantly until it reached 73% in the sixth year. Because construction work has been completed and many workers are no longer involved in the project, this source of income no longer exists.
2.	Improving the quality of SPALD operationalization	12%	Decline in the operational quality of SPALD Sekar Arum after six years. In accordance with the estimated useful life of SPALD Sekar Arum for 50 years, which means a decrease in quality of 4% every year.
3.	Improving the quality of public health	12%	
4.	Awareness raising, Behavior change, and Community support for SPALD	12%	
5.	People who socialize more often	12%	
6.	Become a place of learning about communal WWTP	12%	
7.	Environmental quality improvement	12%	
8.	Increase people's comfort	12%	
9.	Increase the aesthetic value of the environment	12%	
10.	Improve the river ecosystem	12%	

Calculating Effects of Researcher Interventions

In this study, researchers did not provide direct intervention in the implementation and management of SPALD Sekar Arum in Malang City. Researchers only act as observers and analysts who collect and analyze data related to the results achieved from the project.

The main interventions in the SPALD Sekar Arum program are the construction of sanitation infrastructure, outreach and training, carried out by the Government and other involved parties. Therefore, the researcher's influence or contribution to the results observed in this study is considered zero or non-existent. So the outcome value after fixation is as follows:

Table 13. Outcome value after fixation

No	Outcomes	Outcome Value	Dead-weight	Displacement	Attribution	Drop off	Final Outcome Value
1.	Increased revenue	234,000,000	-	-	-	177,600,000	56,400,000
2.	Improving the quality of SPALD operationalization	59,328,000	-	-	-	7,119,360	52,208,640
3.	Improving the quality of public health	108,432,000	-	-	-	13,011,840	95,420,160
4.	Awareness raising, Behavior change, and Community support for SPALD	150,600,000	-	-	-	18,072,000	132,528,000
5.	People who socialize more often	21,084,000	-	-	-	2,530,080	18,553,920
6.	Become a place of learning about communal WWTP	259,200,000	-	-	-	31,104,000	228,096,000
7.	Environmental quality improvement	89,237,376	-	-	-	10,708,485	78,528,891
8.	Increase people's comfort	43,488,000	-	-	-	5,218,560	38,269,440
9.	Increase the aesthetic value of the environment	32,616,000	-	-	-	3,913,920	28,702,080
10.	Improve the river ecosystem	21,744,000	-	-	-	2,609,280	19,134,720
	Amount	**1,019,729,376**				**271,887,525**	**747,841,851**

Source: processed data

Calculating Social Return on Investment (SROI), Includes the Following Stages

Calculating net present value (NPV)

SROI analysis with an evaluative approach focuses on measuring the impact of an intervention that has occurred. So that the data collected and processed provides information about what has happened and its impact is measured. In projective SROI research, the Net Present Value calculation method is used to predict the future impact of a project or intervention. NPV is needed to measure future financial profits by considering the time value of money, which is the concept that money owned now is more valuable than the same amount of money in the future.

In the context of evaluative SROI research, Net Present Value (NPV) is not calculated. So that the main focus of this study is to evaluate the impact that has occurred, not to predict or forecast future impacts, so that actual and concrete impact measurements can be obtained.

Calculating the ratio

The investment or input value used to realize SPALD Sekar Arum in Malang City is IDR 507,200,000,- which includes organizing outreach and training, building SPALD Sekar Arum infrastructure, as well as monitoring and evaluation. All of these elements contribute to achieving the main objectives of the program, namely increasing community awareness and commitment and providing adequate sanitation facilities to manage domestic wastewater well.

Meanwhile, the return value or impact value resulting from this investment after 6 years (after Drop-off) reached IDR 747,841,851,- which includes economic, social and environmental impacts that occur as a direct result of investments and activities that have been carried out. Thus, the SROI ratio of this study is IDR 747,841,851 divided by Rp. 507,200,000. the benefit obtained is IDR 1.47,-.

Sensitivity analysis

Changes in the assumptions used in the SROI calculation can affect the final results of the Social Return on Investment Analysis of the Sekar Arum Domestic Waste Water Management System in Malang City. The description of the sensitivity analysis in this study is as follows:

1. Changes in Investment Costs: If the investment costs for this program change, either increase or decrease, this will affect the SROI value. For example, if investment costs increase, the SROI ratio will decrease, and vice versa.
2. Changes in Return Value: The return value of IDR 747,841,851,- is based on various factors, including the number of officials and communities who take part in socialization and training, as well as increases in environmental quality scores. If there is a change in any of these factors, for example the number of participants or outreach costs decreases, then this will reduce the return value and therefore the SROI ratio.
3. Changes in Social and Environmental Impacts: Changes in increasing public awareness, changing behavior, and environmental quality will also affect the SROI score. If the value of the social and environmental impacts is less than what has been calculated, the SROI value will decrease.

The assessments and assumptions used in this analysis are lower limit assessments. Therefore, the value obtained is the minimum value and the sensitivity can be said to be high. So while the current SROI ratios portray a positive situation, it also means that small changes in these assumptions could have a sizeable impact on the final SROI assessment results. Therefore, good monitoring and evaluation is needed to ensure that the program is running according to plan to achieve the desired results.

Payback Time

Through the analysis of Social Return on Investment SPALD Sekar Arum in Malang City, information is obtained that the time needed to return the investment capital of IDR 507,200,000, - which is returned through the economic, social and environmental benefits generated by the SPALD Sekar Arum program will return or BEP in the fourth year, with the following calculations:

The total outcome value for the 6 year period is IDR 747,841,851,- so the average outcome value per year is:

IDR 747,841,851,- / 6 years = IDR 124,640,308.5,- per year

So, the investment break-even point is obtained by dividing the total investment by the average outcome value per year:

IDR 507,200,000,- / IDR 124,640,308.5,- per year = 4.07 years

So, based on these calculations the Sekar Arum SPALD program reached a breakeven point after about 4.07 years, or about 4 years and 1 month, after the Sekar Arum SPAD was built. This means that after the program has been running for six years, a return on capital and excess benefits have been obtained from the benefits felt by the community from the total economic, social and environmental value generated. This shows that the SPALD Sekar Arum program can generate benefits that exceed the investment capital in that time period.

CONCLUSION

Based on the results of the SROI analysis that has been carried out, it can be concluded that the Sekar Arum Domestic Wastewater Management System (SPALD) program in Malang City has had a significant positive impact. In a six-year period, with an

investment value of IDR 507,200,000, an outcome value of IDR 747,841,851 has been produced.

The resulting SROI ratio is 1:1.47, meaning that every IDR 1 invested generates an added value of IDR 1.47. With the return on investment or BEP (Break Even Point) reached in the fourth year, it shows that SPALD Sekar Arum has effectively had a positive impact on the community. Considering that SPALD Sekar Arum is a program that is not directly aimed at increasing the economic capacity of the community but can have a significant impact

Furthermore, this program also supports the achievement of the Sustainable Development Goals (SDGs), especially in terms of increasing access to sanitation for the community. In other words, SPALD Sekar Arum shows that programs designed to preserve the environment and prevent pollution can also contribute to improving the economy and community welfare.

This shows that investment in the SPALD Sekar Arum program not only brings social and environmental benefits, but also economic benefits for the surrounding community. By seeing these results, it is hoped that stakeholders can see the importance of this kind of investment and plan similar programs in the future to improve community and environmental welfare.

The collaboration that exists between the Ministry of PUPR, PUPR PKP Malang City Service, the private sector, and the active participation of the community also plays an important role in achieving the effectiveness of SPALD Sekar Arum. These stakeholders, through their respective roles and contributions, have supported the effective implementation and management of SPALD Sekar Arum. The Ministry of PUPR and the Public Works and Public Housing Agency PKP Malang City provide support in terms of funding and regulation, the private sector contributes through technical know-how and best practices, while the community actively participates in the use and maintenance of the facility. Collaboration like this not only results in more holistic solutions to water pollution issues, but also supports the achievement of more sustainable and impactful outcomes.

REFERENCES

Bardy, R., Massaro, M., & Rubens, A. (2013). *Sustainable Development in the Developing World: A Holistic Approach to Decode the Complexity of a Multi-Dimensional Topic: Vol. Volume 4*. CreateSpace Independent Publishing Platform.

Bogdan, R. C., & Biklen, S. K. (2007). *Qualitative Research for Education: An Introduction to Theory and Methods* (Allyn & Bacon, Eds.; Fifth Edition).

Budiono, A. (2012). *Alternatif Pendanaan Untuk Sektor Pengembangan Penyehatan Lingkungan Permukiman*.

Cahyono, W. H., Wahyu, Aisyah, S., & Halang, B. (2011). Pengetahuan, Sikap dan Perilaku Kepala Rumah Tangga Terhadap Pengelolaan Air Limbah Rumah Tangga. *EnviroScienteae*, *7*, 50–57.

Cavalluzzo, K. S., & Ittner, C. D. (2004). Implementing performance measurement innovations: Evidence from government. *Accounting, Organizations and Society*, *29*(3–4), 243–267. https://doi.org/10.1016/S0361-3682(03)00013-8

Cook, T. J., Vansant, J., Stewart, L., & Adrian, J. (1995). Performance Measurement: Lessons Learned for Development Management. In *Pergamon WorldDevelopmenr* (Vol. 23, Issue 8).

Creswell, J. W. (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (Third Edition). SAGE Publications, Inc.

Creswell, J. W., & Poth, C. N. (2016a). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications Inc.

Creswell, J. W., & Poth, C. N. (2016b). *Qualitative Inquiry and Research Design: Choosing Among Five Approaches*. SAGE Publications Inc.

Denzin, N. K., & Lincoln, Y. S. (2011). *The SAGE Handbook of Qualitative Research*. SAGE Publications Inc.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & Colle, S. de. (2010). *Stakeholder Theory: The State of The Art*. Cambridge University Press.

Hadimuljono, B. (2022). *Menteri Basuki Ajak Kementerian/Lembaga dan Swasta Kolaborasi Penuhi Kebutuhan Air Bersih dan Sanitasi Layak*. Kementerian PUPR. https://pu.go.id/berita/menteri-basuki-ajak-kementerianlembaga-dan-swasta-kolaborasi-penuhi-kebutuhan-air-bersih-dan-sanitasi-layak

Hall, M., & Millo, Y. (2018). Choosing an Accounting Method to Explain Public Policy: Social Return on Investment and UK Non-profit Sector Policy. *European Accounting Review*, *27*(2), 339–361. https://doi.org/10.1080/09638180.2016.1261721

Henriques, A., & Richardson, J. (2004). *The Triple Bottom Line* (1st edition). Routledge.

Hood, C. (1991). *A Public Management For All Seasons? 69*, 3–19.

Kospa, H. S. D., & Rahmadi, R. (2019). Pengaruh Perilaku Masyarakat Terhadap Kualitas Air di Sungai Sekanak Kota Palembang. *Jurnal Ilmu Lingkungan*, *17*(2), 212. https://doi.org/10.14710/jil.17.2.212-221

Lawlor, E., Neitzert, E., & Nicholls, J. (2008). *Measuring value: a guide to social return on investment (SROI)*. New Economics Foundation.

Miles, M. B., Huberman, A. M., & Saldana, J. (2014). *Qualitative Data Analysis* (Third Edition). Sage Publications, Inc.

Nicholls, J., Lawlor, E., Neitzert, E., & Goodspeed, T. (2012). *A guide to Social Return on Investment* (S. Cupitt, Ed.; Second Edition). The SROI Network by Matter&Co.

Peraturan Menteri PUPR. (2017). Nomor 04 Tahun 2017 tentang Penyelenggaraan Sistem Pengelolaan Air Limbah Domestik

Purwohedi, U., & Gurd, B. (2019). Using Social Return on Investment (SROI) to measure project impact in local government. *Public Money and Management*, *39*(1), 56–63. https://doi.org/10.1080/09540962.2019.1537706

Rotheroe, N., & Richards, A. (2007). Social return on investment and social enterprise: transparent accountability for sustainable development. *Social Enterprise Journal*, *3*(1), 31–48. https://doi.org/10.1108/17508610780000720

Rowlatt, A. (2017). *Value for Money Framework Moving Britain Ahead*.

Santoso, H. (2018). *INFID Paparkan Tiga Tantangan Pelaksanaan SDGs di Indonesia*. Antaranews. https://jatim.antaranews.com/berita/250524/infid-paparkan-tiga-tantangan-pelaksanaan-sdgs-di-indonesia

Santoso, M. B., Humaedi, S., Raharjo, S. T., & Mulyono, H. (2021). Transformasi Nilai Sosial Budaya Menjadi Keuntungan Ekonomi: Refleksi Hasil Perhitungan Social Return On Investment (SROI) Program Siba Batik Kujur. *Share : Social Work Journal*, *11*(1), 31. https://doi.org/10.24198/share.v11i1.33210

Speklé, R. F., & Verbeeten, F. H. M. (2014). The use of performance measurement systems in the public sector: Effects on performance. *Management Accounting Research*, *25*(2), 131–146. https://doi.org/10.1016/j.mar.2013.07.004

Sugiyono. (2013). *Metode Penelitian Kuantitatif, Kualitatif, dan R&D* (19th ed.). Penerbit Alfabeta.

Tasruddin, R. (2018). Proses Kolaborasi Antar Pemerintah, Swasta, Dan Masyarakat Dalam Implementasi Kebijakan Pemerintah Daerah. *Jurnal Komodifikasi*, *2*(1).

Then, V., Schober, C., Rauscher, O., & Kehl, K. (2017). *Social Return on Investment Analysis Measuring the Impact of Social Investment*. https://doi.org/https://doi.org/10.1007/978-3-319-71401-1

Thomas, A. O. B., Madaj, B., Charles, A., & Van Den Broek, N. (2015). Social Return on Investment (SROI) methodology to account for value for money of public health interventions: A systematic review. In *BMC Public Health* (Vol. 15, Issue 1). BioMed Central Ltd. https://doi.org/10.1186/s12889-015-1935-7

Veronica. (2020). Analisis SROI (Social Return on Investment) Dalam Mengukur Keberhasilan Program Csr Mikrohydro Oleh PT. PJB UP Paiton Di Desa Andungbiru, Kabupaten Probolinggo. *Jurnal Ilmiah Politik, Kebijakan, & Sosial (Publicio)*, *2*(2).

Whittaker, J. B. (1995). *The Government Performance and Results Act of 1993 : A Mandate for Strategic Planning and Performance Measurement*.

Yin, R. K. (2018). *Case Study Research and Application Design and Methods* (Sixth Edition). SAGE Publications Inc.