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Social Value of the Irrigation Water Utilization Improvement Program

Nasta Inah

Student of Master of Accounting Study Program, Faculty of Economics and Business, Universitas Brawijaya, East Java, Indonesia

Corresponding author email: nastain@pu.go.id

Erwin Saraswati

Lecturer in the Master of Accounting Study Program, Faculty of Economics and Business, Universitas Brawijaya, East Java, Indonesia

Email: erwin@ub.ac.id

Abdul Ghofar

Lecturer in the Master of Accounting Study Program, Faculty of Economics and Business, Universitas Brawijaya, East Java, Indonesia

Email: ghofar@ub.ac.id

Abstract---The Cash for Work (CfW) program or known as Padat Karya Tunai (PKT) is an innovation by the central government and village governments to provide productive activities to reduce poverty and to implement sustainable development. The purpose of this study was to analyze the performance effectiveness of the irrigation water utilization improvement program (P3-TGAI) from the perspective of social, economic, and environmental impacts based on the SROI method. This research is qualitative research with a case study approach. Evaluation will be carried out from 2021 to 2022. The validity test of the data using triangulation and member checking. The research site is located in Tirtomulyo Village, Kretek District, Bantul Regency. The results of the research show that the irrigation water utilization improvement program (P3-TGAI) has proven to have created broader social values, not limited to purely technical aspects. The calculation of the SROI ratio shows that every IDR 1 invested generates IDR 1.66 of social value. Thus, the program can be said to be effective so that it can be further implemented.

Keywords---CfW, irrigation water utilization, P3-TGAI, PKT, SROI.

Introduction

The Cash for Work (CfW) program or public works has recently received great interest in development policies due to the potential double dividends of this program, namely that apart from being able to provide basic infrastructure, it can also create jobs and income for vulnerable households (Zintl & Loewe, 2022). With this double dividend, CfW is a pro-poor workforce market policy instrument, social protection, and infrastructure investment (Loewe, 2021).

In Indonesia, the Cash for Work program or known as Padat Karya Tunai (PKT) is an innovation by the central government and village governments to provide productive activities to reduce poverty and is a form of Indonesia's commitment to implementing the Sustainable Development Goals (SDGs) (Effendi et al., 2020). In line with efforts to strengthen the handling of COVID-19, especially for low-income people affected by the Covid-19 pandemic, the Ministry of Public Works and Housing is implementing the CfW program in the 2020 budget year with a target of absorbing a workforce of 638,990 people (Kementerian PUPR, 2020). In addition to increasing people's purchasing power and accelerating economic recovery, CfW also aims to distribute funds to villages/remote areas (Ditjen Bina Konstruksi, 2022).

One of the CfW programs of the Ministry of Public Works and Housing in the Water Resources Sector, namely the irrigation water utilization improvement program (P3-TGAI), which aims to improve the performance of irrigation services, can also absorb a large number of workers. As released on the website of the Ministry of Public Works and Housing, it is known that the irrigation water utilization improvement program (P3-TGAI) for the 2020 budget year has absorbed 100% of the targeted workforce, namely 200,000 workers spread across 10,000 locations (Kementerian PUPR, 2020). To measure whether or not the results of a program that is a public investment are effective, it is necessary to carry out an evaluation based on systematic scientific procedures. Therefore, we need a tool that can measure the performance of the program whether it has been effective or not, in other words, whether the results of the program are by the planned objectives, and how the benefits of the public investment are for the community.

Benefits from public investments such as health improvements, for example, are often intangible or not easily converted into monetary amounts. As a result, several tools have been developed to measure 'social value', and one that is gaining prominence is an approach known as 'social return on investment' (SROI) (Arvidson et al., 2014). SROI is a type of cost-benefit analysis (CBA) developed to reflect the value of intangible benefits/social value in a way that CBA sometimes fails to do (Arvidson et al., 2013). SROI is an approach that builds on CBA and is used in the evaluation of projects with social benefits, as an alternative to CBA and theory-based evaluation (Muyambi et al., 2017). The SROI method is used as an adequate scientific tool to understand and improve the effectiveness and efficiency of public administration funding and management of social entities (Ruiz-Lozano et al., 2020). Using the SROI method, socio-economic value is measured by quantifying the elements that make up the social value of an activity and then monetizing it (Emerson, 2003), using the financial proxy value for the results identified in the intervention logic model (Theory of Change/TOC) (Hutchinson et al., 2019; Nicholls, 2017).

In line with what Farr & Cressey (2019), stated, SROI is a popular social impact assessment method and is receiving increased attention both academically and professionally (Corvo et al., 2022). Social impact assessment combines social research, public engagement, social change planning, and management (Bakar et al., 2015). Social impact measurement aims to assess the social and environmental results of the activities or operations of any organization (Corvo et al., 2021). The social impact caused by each organization in the medium to long term can be positive or negative and can affect the welfare of society, community, and collectivity (Corvo & Pastore, 2021).

The advantage of SROI is that it uses a monetary value to measure cash, spending, and social or environmental benefits. It is the benefit ratio that will be calculated (Nicholls, 2017). Through SROI analysis, the social, economic, and environmental values created by an organization can be understood, measured, and reported (Lawlor et al., 2008). SROI analysis can include the social value generated by the entire organization, or focus only on one specific aspect of the organization's work (Millar & Hall, 2013; Nicholls, 2017; Nicholls et al., 2012). (Morón & Klimowicz, 2021), revealed that the use of the SROI method in evaluation studies has advantages, one of which is that SROI can be used to assess the long-term impact of a program based on its social, environmental, and economic values for the community.

Although the first applications of the SROI model were registered in the US and later in the UK, the models are not geographically limited to those regions. SROI has become an international product implemented by various organizations in Europe and Asia (Corvo et al., 2022). Through a comprehensive and participatory approach, SROI seems to fit the context in Indonesia. Indonesia is seen as a collectivist culture, with an emphasis on shared values and the maintenance of social beliefs (Purwohedi & Gurd, 2019).

The research will be carried out in the Karen Irrigation Area which is located in the Tirtomulyo Village, Kretek District, Bantul Regency, Province of D.I. Yogyakarta. The selection of research locations was based on the socio-cultural conditions of the Tirtomulyo Village community which has a population of 7,752 people, 62.75% of whom have livelihoods in agriculture and there are 15 groups of Farmers in it (Peraturan Desa Tirtomulyo, 2017). In addition, the development status of the Tirtomulyo Village based on the Development Village Index is included in the advanced classification, while based on the Village Development Index it is included in the independent classification (Bappeda Kabupaten Bantul, 2020). The beneficiaries of P3-TGAI in Karen Irrigation Area are community groups of water-using farmers who are members of the Association of Farmers (P3A) Tani Mulyo which was founded in 2010 and ratified in 2018.

Although there is a wealth of literature on SROI, little is known about how SROI has been implemented in the public sector for project management (King, 2014), especially in developing countries (Purwohedi & Gurd, 2019). Therefore, this study will analyze the performance effectiveness of The Irrigation Water Utilization Improvement Program (P3-TGAI) from a social, economic, and environmental perspective using the SROI method. So this study aims to analyze the performance effectiveness of the P3-TGAI from the perspective of social, economic, and environmental impacts based on the SROI method.

Method

This research is qualitative research with a case study approach. The case studies in this research are limited to programs in the public sector with the Cash for Work scheme, namely The Irrigation Water Utilization Improvement Program (P3-TGAI) for the 2020 budget year to analyze the impact of the program on beneficiaries due to the Covid-19 pandemic in the Karen Irrigation Area, using evaluative SROI analysis. Therefore, the evaluation will be carried out from 2021 to 2022 after the program is completed. The research object is located in Tirtomulyo Village, Kretek District, Bantul Regency, Province of D.I. Yogyakarta.

The data used in this study is a combination of primary data and secondary data. Primary data was obtained through a Focus Group Discussion with P3A Tani Mulyo, Workforce, and Community Assistance (TPM) of Karen Irrigation Area. In addition, primary data was also obtained through interviews with informants from the Serayu Opak River Basin Organization (BBWS Serayu Opak), the Directorate General of Water Resources, Ministry of Public Works and Housing. Secondary research data in the form of documents and archival records obtained from relevant stakeholders include (1) a Final Report of the accelerated irrigation water use program for the Progo Opak Serang River Region for the 2020 budget year obtained from BBWS Serayu Opak, (2) Proposed Prospective Recipients of the P3-TGAI, Work Plan and Final Report for the 2020 budget year obtained from P3A Tani Mulyo, (3) and Monthly Reports of P3-TGAI for the 2020 budget year obtained from TPM, and (4) information released through the official websites of related agencies such as the Ministry of Public Works and Housing, the Central Bureau of Statistics, and so on.

Data collection techniques used in this study include (1) Interviews, (2) Focus Group Discussions (FGD), and (3) Documentation. The first data collection technique in this study was through interviews with informants from related agencies, namely BBWS Serayu Opak as a program contributor. Interviews were conducted face-to-face at the BBWS Serayu Opak office with representatives of the Balai Implementation Team (TPB) who were involved in the implementation of the P3-TGAI in Progo Opak Serang River Region, by first preparing the interview protocol to be used. This study uses triangulation and member checking as a validation strategy to test the validity of the data used in the study. This is in line with what is recommended by (Creswell & Poth, 2018). Triangulation is seen as a qualitative research strategy to test validity through the convergence of information from various sources (Carter et al., 2014).

Results and Discussion

This study uses six stages of SROI analysis (Nicholls et al., 2012), which are the sequential steps followed by the researcher in conducting the data analysis.

Establishing scope and identifying stakeholders

Stage 1 in the SROI analysis consists of 3 (three) steps that must be carried out to determine the scope and identify the main stakeholders in the research. The first step is to determine the scope. The scope or limitations of the program in this study, namely The Irrigation Water Utilization Improvement Program (P3-TGAI) in the Karen Irrigation Area (DI), located in Tirtomulyo Village, Kretek District, Bantul Regency, D.I. Yogyakarta Province, Indonesia.

The P3-TGAI Karen Irrigation Area activities were carried out in a self-managed manner by P3A Tani Mulyo, with the scope of activities namely improving the function and condition of the existing 430.56-meter irrigation network with cyclopean concrete. In general, the implementation of P3-TGAI activities is utilized for smallholder agriculture with priority commodities in the form of rice, horticulture, and/or plantations. In this case, Karen Irrigation Area's agricultural commodities are rice and corn.

The second step identify stakeholders. Stakeholder identification is carried out on people or organizations that have experienced both positive and negative changes as a result of the program. Next, the researcher identifies how stakeholders affect or are affected by the program, then decides which stakeholders to involve in the research. The identification results are presented in the following table:

Table 1
Stakeholder Analysis

<i>Stakeholders</i>	Stakeholder Category	Role in the Program	Influence Has	Program Support	Involvement in Research
BBWS Serayu Opak	Program Contributor	Facilitating P3-TGAI	Improving the function of irrigation services and distributing funds to villages	Positive	Be included
P3A Tani Mulyo	Program Executor	Submit proposals and carry out repairs/rehabilitation/improvement of irrigation networks, as well as maintain irrigation networks	Maintain and optimize program outcomes	Positive	Be included
Workforce (Workers and Builders)	Program Executor	Carry out repairs/rehabilitation/improvement of irrigation networks	Repair and improve the function of irrigation networks	Positive	Be included
Community Assistance (TPM)	Program Executor	Facilitate planning, implementation, reporting, monitoring, and evaluation processes at the community group level	Assistance for program beneficiary communities in achieving outcomes	Positive	Be included
Department of PUP & Residential Areas, Bantul Regency	The management authority holder of Karen Irrigation Area	Validation of needs and priorities for repair/rehabilitation/improvement of irrigation networks, and maintenance of irrigation networks	There aren't any	Not significant	Not included

Source: Results of interviews and document review

The first major stakeholder comes from BBWS Serayu Opak as a program contributor. P3-TGAI implementers at the BBWS level consist of the Balai Implementation Team (TPB), the Head of the Work Unit (Kasatker), and the Commitment Making Officer (PPK). The stakeholders involved in this research are the Chairperson of the TPB who also serves as the Head of Operations and Maintenance of BBWS Serayu Opak. Furthermore, the Head of TPB appointed a member of the P3-TGAI Swakelola Team for the Progo Opak Serang River Region where Karen Irrigation Area is located, to represent BBWS Serayu Opak as a stakeholder in this research. The appointment was based on the member's experience and understanding of implementing P3-TGAI at BBWS Serayu Opak. The second main stakeholder is P3A Tani Mulyo as the beneficiary of P3-TGAI in the Tirtomulyo Village for two consecutive years, namely in the 2020 and 2021 budget years. The organizational structure of P3A Tani Mulyo consists of Chairman, Secretary, Treasurer, 2 Planning Team, 2 Materials Purchasing Teams, 2 Implementation Team, 2 Supervision Team, and 70 Members (Yin et al., 2020; Watson et al., 2016; Wright et al., 2009).

The third main stakeholder, namely the workforce, are residents around the location as well as overseas residents who were primarily affected by the termination of employment (PHK) during the Covid-19 pandemic and have implemented gender equality. Types of P3-TGAI workforce in the Karen Irrigation Area are divided into 2 (two), namely Builders and Workers. The implementation of P3-TGAI in Karen in the 2020 budget year involved a workforce of 19 people with details of 4 male builders; and 15 workers consisting of 6 women and 9 men. In the 2021 budget year, 18 workforces were involved, with details of 3 male builders; and 15 workers consisting of 4 women and 11 men.

The implementation of P3-TGAI at the P3A level is accompanied by Community Assistance (TPM). TPM can only assist at P3-TGAI recipient locations for a maximum of two consecutive years in the same P3-TGAI recipient

village. This is to information obtained that the same TPM accompanied the implementation of P3-TGAI DI Karen in budget years 2020 and 2021. Therefore, TPM is the fourth main stakeholder in this research.

The third step is deciding how to engage stakeholders. In this case, the appropriate method for involving stakeholders in this research is through interviews and FGDs. Interviews were conducted with informants from BBWS Serayu Opak as contributors to the P3-TGAI program with the Cash Work Intensive (PKT) scheme implemented by the Ministry of Public Works and Housing in the D.I. Yogyakarta area. Meanwhile, FGDs were conducted with stakeholders including P3A Tani Mulyo, Workforce (Workers and Builders), and TPM. The FGD was held at the residence of the Head of P3A to facilitate the mobilization of participants and researchers, as well as field visits to research locations.

Mapping outcomes

Stage 2 of the SROI analysis consists of five steps which are carried out to map impacts and put them into the Impact Map column. The first step is to fill in the upper part of the Impact Map which contains information about the organization and scope of the research analysis. Next, fill in the first two columns of the Impact Map which contain stakeholders and desired or unwanted changes, based on the stakeholder analysis that was carried out in the previous stage.

The second step is to fill in the input column which contains contributions of stakeholders on the implementation of the program and can be used during activities, such as money or time. Stakeholders have their respective contributions to realize the implementation of the program, both in the form of money and time. BBWS Serayu Opak as the program contributor, in this case, contributed to channeling funds sourced from the state revenue and expenditure budget (APBN) for the implementation of P3-TGAI. Meanwhile, P3A Tani Mulyo, Workforce and Community Assistance (TPM) as program implementers have contributed in the form of time spent during activities in carrying out the program according to their respective roles.

Furthermore, in assessing how much input is used, it is carried out in the third step at this stage. The third step is assessing inputs such as the size of a financial investment, or other inputs that cannot be monetized such as volunteer time or contributions of goods and services. The input value used is P3-TGAI funding sourced from the APBN in the Work Unit DIPA assigned to carry out P3-TGAI, in this study at the BBWS level. Based on the Technical Guidelines for the Implementation of P3-TGAI, the maximum allocation of P3-TGAI funds is IDR 195,000,000.00 for each P3A in the current budget year. The funds are used by P3A to improve irrigation networks that are carried out by P3A themselves on a self-managed or non-third-party basis. In addition, the amount of these funds includes costs for preparation, coordination, planning, implementation meetings, provision of health facilities, provision of additional vitamins and nutrition, reporting, and documentation of a maximum of 5%.

During the FGD process, researchers obtained information that P3-TGAI DI Karen with beneficiary P3A Tani Mulyo was carried out for two budget year periods, namely in the 2020 and 2021 budget years. Based on this information, the P3-TGAI fund allocation used as the input in this study is IDR 390,000,000.00. The fourth step is to fill in the output column after obtaining information from stakeholders during data collection. The researcher clarifies the output which is a summary of an activity. This information is presented in the fifth column (Output). With the activity of increasing the irrigation network along 430.56 meters in the Karen Irrigation Area, the outputs include: (1) Increasing the function and condition of the irrigation network; (2) Increasing harmony among citizens; and (3) Increasing environmental benefits by using cyclopean concrete.

Furthermore, the fifth step, or the last step at this stage is presented in the sixth column (Outcome) which contains information about the outcome which is a series of events that occur as a result of the output. This chain of events is often described as a theory of change. The output is in the form of increased function and condition of irrigation networks, resulting in economic outcomes including (1) Increased agricultural output, in this case, rice and corn; and (2) PKT savings sourced from the Village Fund in the form of the Angkat Walet program which is carried out two times each year. Angkat Walet is an activity to clean irrigation canals from trash, trees that cover rice fields, and other things that impede irrigation flow. The aim is to facilitate the flow of irrigation used by farmers to irrigate the fields so that the irrigation flow which was originally shallow can return smoothly (Cordes, 2017; Zhang et al., 2021; Xie et al., 2012; Sriartha & Giyarsih, 2017).

The output of increasing harmony between residents, results in an outcome from a social perspective, namely that the community is more harmonious because no more residents are fighting over irrigation water during the dry season. This was conveyed by the FGD participants who stated that the characteristics of the residents in the village were previously temperamental because residents were fighting over each other to irrigate their respective fields,

especially during the dry season. So, the existence of P3-TGAI provides a sizable social impact for residents because they no longer need to worry about a shortage of irrigation water during the dry season.

The output of increased environmental benefits by using cyclopean concrete, results in an environmental outcome, namely the potential for water loss due to soil seepage is reduced. Before the existence of the P3-TGAI, residents who were also participants in the FGD revealed that there was a lot of water loss due to the inadequate condition of the irrigation network, so irrigation water could not optimally irrigate the residents' rice fields.

Evidencing outcomes and giving them value

Stage 3 of the SROI analysis consists of four steps taken to provide an outcome assessment through several indicators. If the outcome cannot be assessed financially then assumptions and proxies are used. The first step is to clarify one or more indicators for each outcome. Disclose indicators that can be measured within the scope of the research, not finding indicators that are easy to measure. The implementation of the first step in the Impact Map is carried out by filling in the seventh column (Indicators).

The second step is to collect data on indicators from internal and external sources or collect new data. Several indicators in this study use new data that comes from stakeholders who are directly involved in creating social value, namely P3A Tani Mulyo, Workforce, and TPM. In addition, this study also used external data sources from the Department of Agriculture and Food Security, D.I. Yogyakarta province. The implementation of the second step in the Impact Map is by filling in the eighth column (Source of Information) and the ninth column (Quantity).

The third step determines how long the outcome will last. Researchers asked stakeholders how many years the benefits lasted after their intervention. The implementation of the third step in the Impact Map is by filling in the tenth column (Duration).

Finally, the fourth step is to give value to the outcome, or what is commonly called monetization. Identification of financial value is carried out on the outcome. If the outcome uses assumptions and proxies because it cannot be assessed financially, then the selection of proxies must be based on clear decision logic, and supported by evidence why choosing a particular proxy to describe that value. The implementation of the fourth step in the Impact Map is carried out by filling in the Financial Proxy, Value, and Source columns.

Based on the results of the interviews and FGDs, it is known that after the implementation of the P3-TGAI in the Karen Irrigation Area there has been an increase in agricultural yields, especially in 2/3 of the paddy field area (out of a total of 40 Ha). The indicator is an increase in the quantity of rice commodity yields by 1 ton/ha in the form of milled dry grain (GKG). Harvesting is done two times a year according to the rice planting period in Karen Irrigation Area. Furthermore, the stakeholders explained that the crop yields were stored by farmers in the form of rice to support food self-sufficiency, while the grain husks were used for animal feed. Moreover, if during the next harvest period, there is an excess of stored rice, sales will be carried out at a price of around IDR 8,500.00 per kg.

Following up on this information, the researchers searched the food price database in the D.I. Yogyakarta province through the website of the Department of Agriculture and Food Security, D.I. Yogyakarta province. The cheapest rice price as of December 30, 2021, is IDR 8,200.00 per kg (Dinas Pertanian dan Ketahanan Pangan DIY, 2021). This value is used to monetize the outcome.

Furthermore, to calculate the number of outcomes, it is necessary to convert from milled dry grain (GKG) to rice. Information on the conversion rate from GKG to rice was obtained from the BPS website for Southeast Sulawesi Province which presents data for all provinces in Indonesia, and the latest data update was recorded on August 14, 2022. The conversion rate for GKG to rice for the D.I. Yogyakarta province is 63.06 %, The value used to monetize the outcome is the price of corn as of December 30, 2021, worth IDR 6,500.00 per kg (Badan Pusat Statistik Provinsi Sulawesi Tenggara, 2022).

The third indicator is related to savings on the Angkat Walet program which is carried out once a year with budget funds sourced from the Village Fund. The value used to monetize the outcome is The Village Fund used to Angkat Walet in Karen Irrigation Area is Rp. 2,000,000.00. The changes that have occurred with the existence of P3-TGAI are that temporarily there is no need for Angkat Walet activities on the Karen Irrigation Area irrigation canals due to the use of cyclopean concrete so the risk of blocked irrigation canals is reduced. It can be said that the three indicators that have been discussed represent changes that occur from an economic standpoint.

The fourth indicator represents changes that occur from a social perspective in the form of harmony between residents. The community becomes more harmonious because no more people are fighting over water during the dry season. The indicator is that there are no more queues for water carried out by sixty people every night. As for the value used to monetize the outcome is the lowest wage for a farm worker in D.I. Yogyakarta, which is Rp. 32,000.00 per day (Republika, 2021).

The fifth indicator represents changes that have occurred from an environmental standpoint in the form of a reduction in the potential for water loss due to soil seepage. Loss of irrigation water due to seepage results in an unequal distribution of water (the amount of water does not match the needs of the plants). If not resolved, then the paddy fields that are not drained will experience water shortages. Therefore, the indicators used in this study were paddy fields that previously could not be planted because they were not drained, became productive again, or could be planted. Based on the results of the interviews and FGDs, information was obtained that previously unproductive paddy fields could produce up to 3 tons of harvest per planting season after irrigation. Thus, the quantity calculation is obtained as follows:

$$\begin{aligned} \text{Rice} &= 3 \times 630,6 \times 2 = 3.784 \\ \text{Corn} &= 3 \times 1000 \times 1 = 3.000 \end{aligned}$$

The value used to monetize the outcome is based on the cheapest price of Rp. 8,200.00 per kg and the price of corn is Rp. 6,500.00 per kg.

Establishing impact

In Stage 4 of the SROI analysis, impact determination or fixation is carried out to reduce the risk of overclaiming. There are four parts in this stage, including (1) deadweight, the extent to which results will occur even if the activity does not occur; (2) attribution, how much of the result is caused by the contribution of other parties; (3) calculated drop-offs for results lasting more than one year; and (4) calculate the impact.

The first step in calculating impact fixation is to fill in the deadweight column in the Impact Map which is measured as a percentage. In this study, a dead weight of 0% indicates the probability of producing an outcome without a program. This means that without P3-TGAI there will be no increase in agricultural output in Karen Irrigation Area; there are no savings on the Angkat Walet program sourced from the Village Fund; and the potential for reducing water loss due to soil seepage also does not occur.

The second step is to fill in the attribution column which is calculated as a percentage. The approach to estimating attribution used in this study is by asking stakeholders how much the contribution of parties other than program contributors is in realizing the outcome. To outcomes related to increasing agricultural yields, other parties can contribute to making it happen through the Irrigation Network Rehabilitation program by the Ministry of Agriculture. The budget ceiling for 1 unit of Irrigation Network Rehabilitation activity is IDR 75,000,000.00 (Ditjen PSP, 2022). The researcher calculated the amount of the contribution by comparing the amount of the budget ceiling between P3-TGAI and the Irrigation Network Rehabilitation program, with the calculation formula 195,000,000 divided by 75,000,000, the attribution value is rounded off by 3%.

In connection with the saving outcome of the Angkat Walet program whose funds come from the Village Fund, other parties who can contribute to making it happen are the residents of Karen village who carry out Angkat Walet in cooperation. Assuming that the amount of contribution from both parties is the same (50:50), with the calculation formula 100 divided by 50, an attribution value of 2% is obtained.

The third step is to fill in the drop-off column which is calculated by subtracting a fixed percentage from the remaining yield level at the end of each year. In this study, the outcomes that experienced a decline in the future were related to increased crop yields and reduced potential water loss due to soil seepage. Both of these occurred due to the use of cyclopean concrete to improve the function and condition of irrigation canals, thus increasing the duration or useful life of the irrigation structures for 20 years. Thus, with the calculation formula 100 divided by 20, a drop-off value of 5% is obtained.

After the column of dead weight, attribution, and drop-off is filled in the Impact Map, the next step is to calculate the impact. The impact calculation for each outcome used the formula as follows:

$$\text{Impact} = (\text{quantity} \times \text{financial proxy value}) - \text{dead weight} - \text{attribution}$$

Calculating SROI

Stage 5 in the SROI analysis is doing the SROI ratio calculation. The steps used in this study include: (1) projecting into the future; (2) calculating the present value (PV); and (3) calculating the ratio. The first step is to project the value of all the outcomes achieved into the future. The calculation uses the formula of impact value minus the drop-off for each future period after the first year. The second step is calculating the present value. Considering that the

research period is only two years, the present value calculation uses the following formulation, where 'r' represents the discount rate:

$$\text{Present Value} = \frac{\text{Value of impact in Year 1}}{(1 + r)}$$

The discount rate refers to the interest rate set by Bank Indonesia in 2021 and 2022, which is an average of 3.5%. The calculation result shows that the total present value is IDR 624,804,761.98. The next step is to calculate the SROI ratio, with the following formulation:

$$\text{SROI ratio} = \frac{\text{PV of Benefits}}{\text{PV of Investments}} = \frac{624.804.761,98}{376.811.594} = 1,66$$

Based on the formula above, it is known that the SROI ratio of P3-TGAI Karen Irrigation Area is 1:1.66, which means that every IDR 1 invested generates IDR 1.66 of social value. Thus, the program can be said to be effective so that it can be further implemented.

Reporting, using, and embedding

At this stage, the researcher provides recommendations or provides reports to stakeholders, especially program contributors about what an organization can learn from the information generated through the entire SROI process. Organizations need to respond to research findings and think about the implications for organizational goals, governance, systems, and work practices. Thus, evaluative SROI analysis can generate changes in the organization.

P3-TGAI Karen Irrigation Area, which is one of the Ministry of Public Works and Housing's Cash for Work (PKT) programs, has proven to have created social value, not only technical results in the form of improving irrigation networks. Social value is the broader co-benefits that organizations and projects can create, for individuals, communities, and local businesses (Dobson et al., 2020). In this case, P3-TGAI provides wider additional benefits by involving the community in the implementation of the program.

Broadly speaking, when the researcher asked the stakeholders how the impacts felt by the P3-TGAI Karen Irrigation Area from an economic, social, and environmental standpoint, the answer received by the researcher was that the community was more 'serene'. Furthermore, they explained that the impact that was most felt was an increase in the number of crop yields and that people are no longer worried about drought during the dry season.

People no longer need to fight and queue for water at night because their water needs are fulfilled. This has an impact on the social life of the community to become more harmonious. The benefit from the environmental side that is felt by the community is that by using cyclopean concrete to improve the function and condition of irrigation canals, the potential for water loss due to soil seepage is reduced. This has an impact on the residents' rice fields which previously could not be planted because they were not drained, to become productive.

The various benefits felt by the community are used as a basis for determining program outcomes and can be monetized. However, there is some information obtained by researchers that cannot be monetized. For example, people feel happy because the environment around the rice fields is more beautiful. The community also feels helped and facilitated to transport their crops using rickshaws along the side of the irrigation canals that have been repaired. In addition, the community was happy because they had the opportunity to learn and increase their knowledge, especially regarding the implementation of work on improving irrigation networks using cyclopean concrete. Finally, considering that there is still 1/3 of the total area of irrigation services in the Karen Irrigation Area that still needs repairs and improvement of its irrigation network, the community hopes that this program will continue (Li & Wang, 2021; Yates & Marra, 2017; Nicholls, 2017; Sari & Sjah, 2016).

Conclusion

Social impact represents a logical sequence that describes that an organization's inputs and activities lead to a series of outputs, and outcomes, and ultimately to a series of social impacts. The results of the research show that P3-TGAI has proven to have created broader social values, not limited to purely technical aspects. The results of the calculation of the SROI ratio show that every IDR 1 invested generates IDR 1.66 of social value. Thus, the program can be said to be effective so that it can be further implemented. It is recommended to involve more stakeholders to

obtain broader and more in-depth information. Thus, a more comprehensive picture of the performance of an organization or project (in terms of social, economic, and environmental aspects) can be obtained.

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