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Social Return on Investment (SROI) Analysis on Social Project in Hegar Manah Village

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Abstract – This report presents a Social Return on Investment (SROI) analysis for a community streetlight installation project in Hegar Manah Village, a location with a historically high rate of motorcycle theft and associated social harms. The core objective of the initiative is to enhance public safety and reduce criminal activity by improving road illumination in a known hotspot for crime. The SROI methodology—a framework that quantifies and monetizes social, economic, and emotional outcomes—is employed to provide a comprehensive evaluation of the project's value beyond basic financial metrics. Key calculation parameters include an annual prevention of 4.5 robbery cases, each with an average social cost of Rp 57,000,000, resulting in a total avoided cost of Rp 256,500,000 per year. After applying adjustment factors for deadweight and attribution, the net annual social value is Rp184,680,000. With an initial project cost of only Rp3,400,000, the resulting SROI is 54.3: every Rp1 invested generates approximately Rp54.30 in social value. Projecting the impact over five years, the SROI rises to 271.6, underscoring the high effectiveness and scalability of this intervention. Complementary literature and empirical studies corroborate the significant crime-reducing effects of street lighting, supporting the robust outcomes observed in this case study. The findings demonstrate that targeted infrastructure projects can generate substantial social and economic benefits, making a strong case for community-driven safety initiatives.

Keywords: Social Return on Investment (SROI), Streetlight Installation, Crime Prevention, Community Safety, Economic Impact.

Introduction

This social initiative focuses on installing street lighting along a particularly poorly lit section of the road, which has been identified as an area with a high incidence of criminal activity. Specifically, this area is known for frequent motorcycle thefts, commonly referred to as 'begal' in local terminology. Many incidents frequently occur in that area, as confirmed through interviews with local authorities. It is estimated that around four to five cases happen regularly, each resulting in serious consequences such as loss of life, vehicles, injuries, and substantial hospital costs. These recurring incidents underscore the urgent need for enhanced safety measures and effective intervention strategies to prevent further tragedies and protect the community.

Figure 1. Cases of motorcycle theft
Source: https://www.facebook.com/ICKinfo/posts/seorang-pria-menjadi-korban-p3mbgal4n-saat-pulang-kerja-di-wilayah-bugel-salam-c/1035916548750590/

The project aims to improve the safety and security of pedestrians and residents by enhancing visibility and deterring unlawful behavior. This initiative not only addresses immediate safety concerns but also exemplifies how engineering solutions can be applied to

solve community problems, highlighting the practical importance of urban planning, safety systems, and social responsibility—key concepts that undergraduate students in Industrial Engineering should understand as part of their holistic education on sustainable and community-oriented engineering practices.

The primary objective of this initiative is to enhance the overall safety and security of the public by implementing targeted strategies that aim to reduce and prevent unlawful conduct and criminal activities. Furthermore, this effort seeks to promote sustainable social and economic development within the local community by fostering collaborative approaches, evidence-based interventions, and policy improvements that create a safer and more prosperous environment for all residents and stakeholders.

Economic development will use Social Return on Investment (SRoI). Social Return on Investment (SROI) is the most suitable method for evaluating this streetlight installation project because it captures the full value of its impact, far beyond what traditional financial metrics can measure. While the project cost may be relatively modest, its benefits are substantial, including preventing crime, saving lives, and enhancing the sense of safety within the community (Ariza-Montes et al., 2021). SROI translates these social, economic, and emotional outcomes into monetary terms, allowing for a clear and compelling comparison between investment and impact. This approach demonstrates the project's effectiveness and cost efficiency in delivering meaningful change (Díaz-Sarachaga, 2021).

Moreover, Ramli (2024) mentions that SROI provides a powerful tool for communicating value to stakeholders, including donors, government bodies, and local communities. It supports better decision-making by highlighting which projects yield the highest returns in terms of public benefit, and it strengthens funding proposals by providing credible, evidence-based justification for support. In simple terms, SROI helps us see the real value of the project, like saving lives, preventing trauma, and strengthening the community, so everyone understands its actual impact.

To accurately calculate Social Return on Investment (SROI), according to Tamera (2022), it is essential to consider a range of interconnected factors that influence the overall assessment. These include the deadweight loss, which accounts for the outcomes that would have occurred without the intervention; the attribution rate, which measures the portion of the results attributable to the specific program; displacement effects, which assess whether the program's benefits might have shifted problems elsewhere; and the drop-off rate, which examines how the impact diminishes over time. By thoughtfully evaluating each of these elements, we gain a more comprehensive and human-centered understanding of the actual social value generated, ensuring that our analysis reflects not just numbers but the real-world impacts on people's lives.

Nicholls (2021) mentions that deadweight loss refers to the economic inefficiencies that naturally occur within a market economy, even in the absence of specific government interventions or programs. These changes are intrinsic to the functioning of competitive markets and are characterized by the misallocation of resources, leading to losses in potential economic welfare. Such deadweight losses are a fundamental aspect of economic dynamics and can be attributed to various factors, such as market imperfections, externalities, or information asymmetries, that persist independently of targeted policies (Hemel, 2023)

The attribution rate is a metric that systematically accounts for contributions arising

from various efforts or underlying circumstances, thereby providing a comprehensive understanding of the respective influences on the overall outcome. It involves analytical methods that isolate and quantify the impact of specific efforts within the broader context of concurrent activities or external factors (Nolan et al., 2024).

Displacement refers to the phenomenon where the movement or shift of an object or individual results in a negative impact on other parties involved. This concept is often examined within various scientific disciplines, including physics, psychology, and sociology, to understand the implications of such displacements on surrounding systems and stakeholders. The adverse effects may manifest as psychological stress, social disruption, or physical damage, depending on the context (Torche et al., 2024).

Drop-off refers to the duration over which the effects or impact resulting from a specific event, intervention, or stimulus are sustained or observed. It encompasses the temporal span during which the influence remains measurable or significant before gradually diminishing or ceasing altogether (Feor et al., 2023). In this social project, the lamp will also be maintained by the local authority and local villagers, ensuring its continued use for more than five years.

The objective of this analysis is to calculate the Social Return on Investment (SROI) for the streetlight installation project by thoroughly examining how the increased lighting can lead to a potential reduction in robbery cases, thereby generating social and economic benefits for the community.

This comprehensive evaluation aims to thoroughly quantify and analyze the positive impacts and overall value created by the project, providing a detailed insight into its effectiveness and benefits.

Research Problem and Questions

Despite recurring incidents of motorcycle theft and associated social harms in Hegar Manah Village, the area has historically lacked adequate street lighting, a factor often linked to higher crime rates. The absence of adequate lighting creates unsafe conditions that facilitate criminal activities, result in economic losses, and erode the community's perception of safety. Previous interventions in similar contexts globally have demonstrated that enhanced street lighting can significantly reduce crime; however, systematic evaluation and quantification of the social and economic benefits are scarce at the village or rural level. There is a need to rigorously assess whether the installation of streetlights in Hegar Manah delivers measurable improvements in public safety and generates social value that justifies the investment

Based on the problem, the research question for this study would be: How does the installation of streetlights in Hegar Manah Village impact the incidence of motorcycle theft and contribute to the social return on investment (SROI) for the local community?

Method

The article utilizes the Social Return on Investment (SROI) methodology to comprehensively assess the impact of a streetlight installation project in Hegar Manah Village. SROI quantifies both tangible and intangible benefits, translating them into monetary terms to evaluate whether the project yields value beyond its financial investment.

Data Collection and Assumptions

Primary Data Source: Interviews with local authorities, specifically the village head,

were used to estimate the average number of robbery cases per year in the area.

Secondary Data Source: Social cost per robbery case was determined using available data on losses (vehicle value, medical costs, lost income, and potential fatalities), supported by references from existing literature.

Assumptions: The study assumes 4.5 motorcycle robberies per year, based on data from the village head.

Calculation of Social Value

Total Social Cost Avoided: Number of prevented cases × average cost per case.

Adjustment Factors:

1. Deadweight: 10% (accounts for changes that would have occurred without intervention).
2. Attribution: 20% (portion of the outcome attributable directly to the project).
3. Displacement: Not considered significant in this setting.
4. Drop-off: Not applied in the main scenario; scenario assumes effect persists over five years due to local maintenance.

Formula:

$$\text{Net Social Value} = \text{Total Social Cost Avoided} \times (1 - \text{Deadweight}) \times \text{Attribution}$$

Results and Discussions

Assumptions and Calculation

Project Cost: Rp3,400,000, average number of robbery cases per year: 4.5 cases.

Table 1. Total Social Cost

Loss Component	Average per Case (Rp)	Brief Explanation
Motorcycle loss	15,000,000	If mugged, the motorcycle is usually stolen
Hospital expenses	4,000,000	Minor to moderate injuries
Loss of income	2,000,000	Unable to work for 1 week
Risk of death (10% probability)	36,000,000	Based on the total value of Rp360 million × 10%
Total Social Cost	**57,000,000**	

Average social cost per case: Rp 57,000,000, and total social cost avoided per year: Rp 256,500,000

Table 2. Adjustment Factors

Faktor	Asumsi	Nilai Sisa
Deadweight	10%	90%
Attribution	20%	80%
Displacement	0%	100%
Drop-off (per tahun)	0%	100%

Net Social Value = Rp256.500.000 × 90% × 80% = Rp184.680.000
SROI = Net Social Value / Project Cost
SROI = Rp184.680.000 / Rp3.400.000 ≈ 54.3

The total project cost for installing streetlights in a high-crime area is Rp3,400,000. Based on local data, the average number of motorcycle robbery cases in the area is estimated at 4.5 cases per year (based on an interview with the head of the village). Each case carries an average social cost of approximately Rp57,000,000, which includes losses from stolen vehicles, medical expenses, lost income, and in some instances, the economic impact of a fatality. Therefore, by potentially preventing 4.5 cases annually, the total social cost avoided each year is calculated at Rp256,500,000.

To ensure accurate valuation, standard SROI adjustment factors are applied: a deadweight of 10% (accounting for changes that would happen anyway), an attribution rate of 20% (considering contributions from other efforts or circumstances), and no displacement effect.

After applying these adjustments, the net social value generated by the project is Rp184,680,000. Finally, by dividing this net social value by the initial project cost, we obtain the SROI:
SROI = Rp184,680,000 / Rp3,400,000 ≈ 54.3

This means that for every Rp1 invested in the project, approximately Rp54.30 in social value is generated.

Multi-Year Simulation (5 Years)

Assuming a similar impact over 5 years without drop-off, as the local community, local authority, and the village head have mentioned that they will schedule regular checks on the light and installation.
Net Social Value over 5 years = Rp923,400,000
SROI (5 years) = 271.6

Assuming the project continues to deliver the same level of impact over five years without any drop-off in effectiveness, the total net social value generated would amount to Rp923,400,000 (i.e., Rp184,680,000 per year × 5 years). When compared to the initial project cost of Rp3,400,000, the five-year Social Return on Investment (SROI) is calculated as:
SROI = Rp923,400,000 / Rp3,400,000 = 271.6

This means that over five years, every Rp1 invested in this streetlight installation project would yield approximately Rp271.60 in social value, demonstrating a highly impactful and cost-effective intervention.

Conclusions and Recommendations

In a 2021 randomized controlled trial conducted by Chalfin et al. (2022), street lighting interventions were randomly installed across public housing units in New York City. The study documented a statistically significant reduction of at least 36% in nighttime violent and property crimes following the installation of temporary lighting towers. Although this study did not calculate a monetized Social Return on Investment (SROI), the results provide robust empirical support for the hypothesis that well-designed lighting reduces criminal activity through

increased visibility, deterrence, and discouragement of offenses. By contrast, this social project quantifies the exact underlying mechanism but with far greater granularity, translating avoided crimes into economic values such as healthcare cost savings, lost income averted, and lives preserved, resulting in an estimated annual SROI of approximately 54.

Another study by Jain & Biswas (2021) examines the relationship between rural road infrastructure, including street lighting, and crime rates in India, utilizing nationally representative survey data and instrumental variable estimation. Their findings show a statistically significant negative correlation between improved infrastructure and interpersonal or property crime at the village level. Notably, they identify street lighting as one of the key pathways through which road investments reduce criminality. While the Indian study highlights broader socio-economic benefits such as enhanced employment and reduced inequality, it does not monetize these impacts or integrate them into an SROI framework. In comparison, your project offers a structured valuation model and adjustment factors (deadweight, attribution, displacement) to derive a net social impact per unit of investment.

Welsh et al. (2022) note that Meta-analytic reviews of street lighting interventions (e.g., Painter & Farrington) report average crime reductions of approximately 21% across studies from the UK and the US, even when accounting for displacement and adjacent area effects. While these reviews confirm the deterrent effect of lighting, they typically stop at percentage reductions in crime incidence and rarely estimate tangible economic outcomes. In contrast, your initiative assumes prevention of nearly 100% of local robbery cases, arguably in a context of inferior baseline lighting. It uses this projection to compute a high SROI that spans multiple social domains (economic, health, psychological).

To conclude, with an initial investment of just Rp3.4 million, this innovative project is expected to generate approximately Rp184.68 million in social value annually. This impressive figure underscores the significant positive impact the project has on the community and society as a whole. As a result, the social return on investment (SROI) for the project is an excellent 54.3.

Over five years, assuming steady performance and growth, the SROI is expected to rise exponentially to 271.6. This substantial increase over time demonstrates that the intervention is not only highly cost-effective but also yields significant and lasting effects, making it a highly valuable initiative for stakeholders and the broader community alike.

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