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Flood Mitigation as Social Investment: Leveraging SROI for Sustainable Disaster Management

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Abstract

In disaster management, evaluating the value generated from the flood mitigation projects is crucial for assessing the effectiveness, efficiency and sustainability of these social investments. The global and local economic landscapes have recently faced significant challenges, primarily due to resource scarcity coupled with escalating demands. This scenario has intensified pressure on flood mitigation efforts in disaster management, impacting both for-profit and nonprofit sectors that struggle to adapt to the complexities of today's economic environment. Stakeholders across this spectrum, including for-profit enterprises and nonprofit organizations, are actively pursuing funding for various disaster management projects and initiatives. A significant obstacle in securing funding for these projects is the challenge of demonstrating their value, return on investment, particularly since the outcomes often pertain to "soft outcomes" or "intangible value," which are inherently difficult to quantify. As a result, there is an increasing recognition of the need to incorporate the three pillars of sustainability—social, economic and environmental elements into every investment decision related to flood disaster management. This approach not only supports resilience and long-term impact but also aligns with Sustainable Development Goals (SDGs). This article investigates the value of the investment made in the Sungai Muda Flood Mitigation Project, using it as a case study to evaluate the effectiveness of the Social Return on Investment (SROI) methodology in assessing the worth of such investments and its significance in sustaining the sustainability of social investment. The findings of this study reveal a markedly positive net social benefit, quantified as a social return value of RM

4,892,641,540.00, indicating that the program generates RM 4.88 in social benefits for every ringgit invested which consists of social, economic and environmental elements. This positions the project as a substantial social investment that yields significant benefits for individuals, communities and society at large. Consequently, the SROI framework emerges as an invaluable tool for stakeholders seeking to assess sustainability from a financial perspective, including a ringgit-oriented approach, while engaging in social investments within the contemporary economic landscape. The results indicate that the SROI instrument can assist government entities, managers, investors and corporate social responsibility initiatives in aligning social and environmental values with economic objectives. By fostering a holistic understanding of value in flood disaster management, stakeholders can make informed decisions that strengthen the performance and sustainability of their investments.

Keywords: Flood Disaster Management, Social Return on Investment (SROI), Social Investment, Flood Mitigation Projects, Three Pillars of Sustainability

Introduction

In the contemporary landscape, characterized by a heightened focus on flood mitigation projects, the Social Return on Investment (SROI) methodology emerges as a comprehensive approach for demonstrating value, aligning closely with the principles of the Sustainable Development Goals (SDGs) and the foundational three pillars of sustainability. The tripartite framework of sustainability, encompassing social, economic and environmental elements, symbolized by the intersecting circles model with overarching sustainability at its core, underscores the interconnected nature of sustainable development (Purvis et al., 2019). SROI analysis has been recognized as a more holistic method that measures the value of an intervention in relation to its enabling costs. It adopts a broader concept of value, extending beyond mere financial metrics to include social, economic, and environmental dimensions, thereby calculating the total "social value". Internationally acknowledged, SROI is a stakeholder-informed process that assesses the value created for stakeholders by social programs (Context, 2010). Within this framework, it is essential to develop evidence-based evaluation tools to assess social returns and enhance the sustainability of flood disaster management initiatives. While further investment in disaster management may initially appear as a cost, it is crucial to emphasize that the long-term savings resulting from avoided damages can yield substantial benefits in the future.

The literature on SROI has expanded from its origins in the voluntary sector to applications in both public and private domains. A fundamental aspect of this approach is its broad value perspective, defining social value as "the value that stakeholders experience through changes to their lives" (Social Value International, 2015). This framework is driven by a mission to reduce inequality and environmental degradation while improving well-being by incorporating social, environmental and economic costs and benefits (Nicholls et al., 2012). SROI comprises a set of principles that guide thought processes and develop standards for behavior in social investment contexts (United Nations, 2016). As a methodology, the principles of SROI facilitate the creation of a value map that accounts for a comprehensive understanding of how stakeholders

are affected by organizational activities. This enables resource allocation decisions to reflect these impacts (Nicholls, 2017). Ultimately, the SROI framework is designed to empower decision-makers to incorporate these considerations into their choices, promoting more informed and effective investments in flood mitigation as a form of social investment for sustainable disaster management.

Literature review

Leveraging the Principles of Social Return on Investment (SROI) to Enhance Sustainable Disaster Resilience

Social Return on Investment (SROI) offers a comprehensive instrument for quantifying the value of social investments, aligning seamlessly with the SDGs by integrating social, economic and environmental dimensions. SROI has been characterized as a framework for the quantification and accounting of a more expansive notion of value (Corvo et al., 2022). This holistic approach allows for a deeper understanding of impacts that extend beyond mere financial returns. Initially developed by the Roberts Enterprise Development Foundation (REDF) in San Francisco, USA, in 1996, SROI was later adapted by the New Economics Foundation in the United Kingdom in 2008 (Banke-Thomas et al., 2015; Classen, 2015; Hall et al., 2015; Mertens et al., 2015). While SROI is grounded in established economic evaluation frameworks such as cost-benefit analysis (Gibson et al., 2011; King, 2014; Pathak & Dattani, 2014), it distinguishes itself by adopting a more inclusive perspective that encompasses the entirety of social impacts, including multiplier effects (Banke-Thomas et al., 2015; Krlev et al., 2013; Pathak & Dattani, 2014). Moreover, SROI emphasizes robust stakeholder engagement, ensuring that the voices of those affected by interventions are integral to the assessment process (King, 2014; Krlev et al., 2013; Mertens et al., 2015). SROI analysis can be integrated at any stage of the project cycle, making it a valuable tool for governments, investors, corporations and organizations, both for-profit and nonprofit seeking to maximize the returns on their social investments. It can be utilized during initial program planning as well as mid-term and final evaluations, producing "one-off snapshots" that capture value over specific time periods (Context, 2010; Gibbon & Dey, 2011) (see Figure 1).

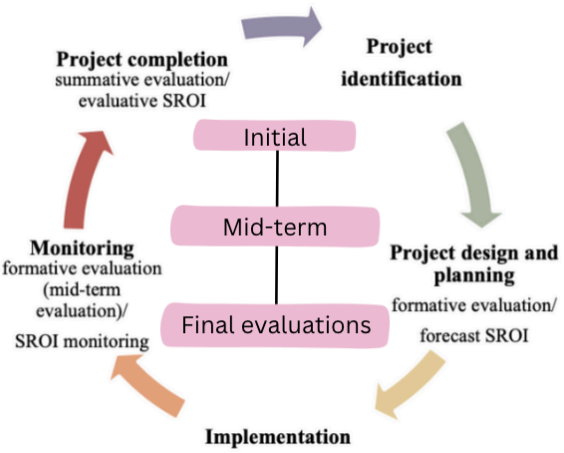

Figure 1: Integrating SROI analysis and evaluation into project cycle
Source: Adapted from Context 2010

Incorporating SROI within sustainability practices is essential for assessing the long-term impacts and viability of interventions. This approach highlights the necessity of aligning organizational objectives with stakeholder expectations to enhance social impact. By converting social outcomes into financial proxies, SROI enables organizations to comprehensively assess the benefits derived from their investments in terms of time, money and resources (Banke-Thomas et al., 2015). SROI can be applied at multiple levels: individual (micro), organizational (meso) and societal (macro) (Krlev et al., 2013), offering valuable insights for impact assessment and empowering stakeholders to make informed resource allocation decisions. The SROI framework is founded on seven principles designed to facilitate effective communication with funders and stakeholders (see Figure 2).

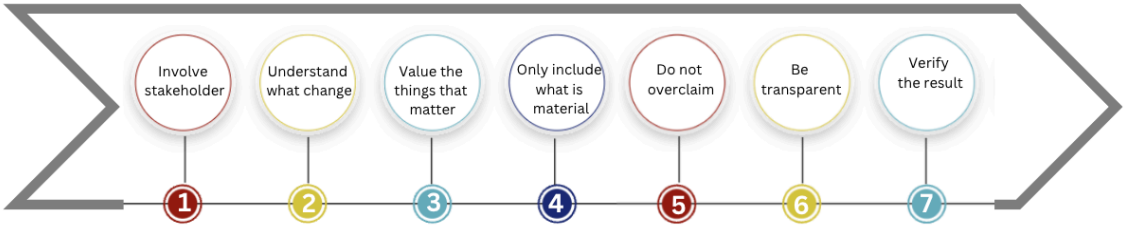

Figure 2: Principles of SROI
Source: Nicholls et al. 2009

Underpinned by concepts such as the theory of change and logic model, SROI analysis draws from traditional economic evaluations (Easterling et al., 2023). The value generated from investments is significantly influenced by the active engagement of stakeholders at various levels, whether they are directly or indirectly affected by the project. In brief, conducting an SROI analysis involves six key stages (Kadel et al., 2022) (see Figure 3), which collectively enhance the effectiveness of disaster resilience strategies and foster sustainable social investments.

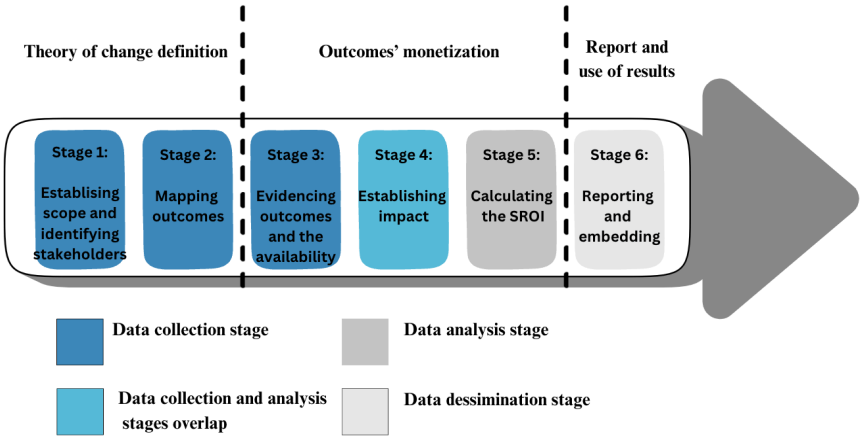

Figure 3: Stages of the SROI process
Source: Own elaboration based on Context 2010, Nicholls et al. 2009

Method and study area

This study employs a quantitative approach, administering a survey to 380 households selected through purposive sampling, specifically targeting farmers residing in the floodplain areas of the Sungai Muda River. The Sungai Muda, located within the borders of Kedah and Pulau Pinang, encompasses a catchment area of 4,210 km² and extends approximately 180 km in length, originating from the Muda Dam and traversing the districts of Baling, Sik and Kuala Muda. This river catchment serves as a vital water source for agricultural, industrial and domestic sectors in both Penang and Kedah. The region is prone to annual flooding during the rainy seasons, which typically occur from April to May and September to November. The increasing frequency and intensity of flooding have exacerbated numerous challenges, including riverbank erosion, water pollution and the depletion of water resources. The most severe flood episode along Sungai Muda in Kedah occurred in October 2003, with subsequent significant floods occurring in 2010, 2014, 2015, 2017, and 2024, each resulting in considerable disruption and damage to the region.

Drawing on the Social Return on Investment framework applied to the Sungai Muda Flood Mitigation Project, this research underscores the foundational pillars of sustainability: social, economic and environmental elements (refer to Figure 4). The instrument of SROI comprises three primary pillars and 19 indicators; however, this study has selected only seven indicators pertinent to the Sungai Muda Flood Mitigation Project, aligning them with the specific research objectives and contextual requirements. It is essential to acknowledge that the selection of indicators may vary based on the particular context and timeframe of the study. Despite variations in specific indicators across different cases, the core pillars of sustainability; social, economic and environmental remain consistently applicable.

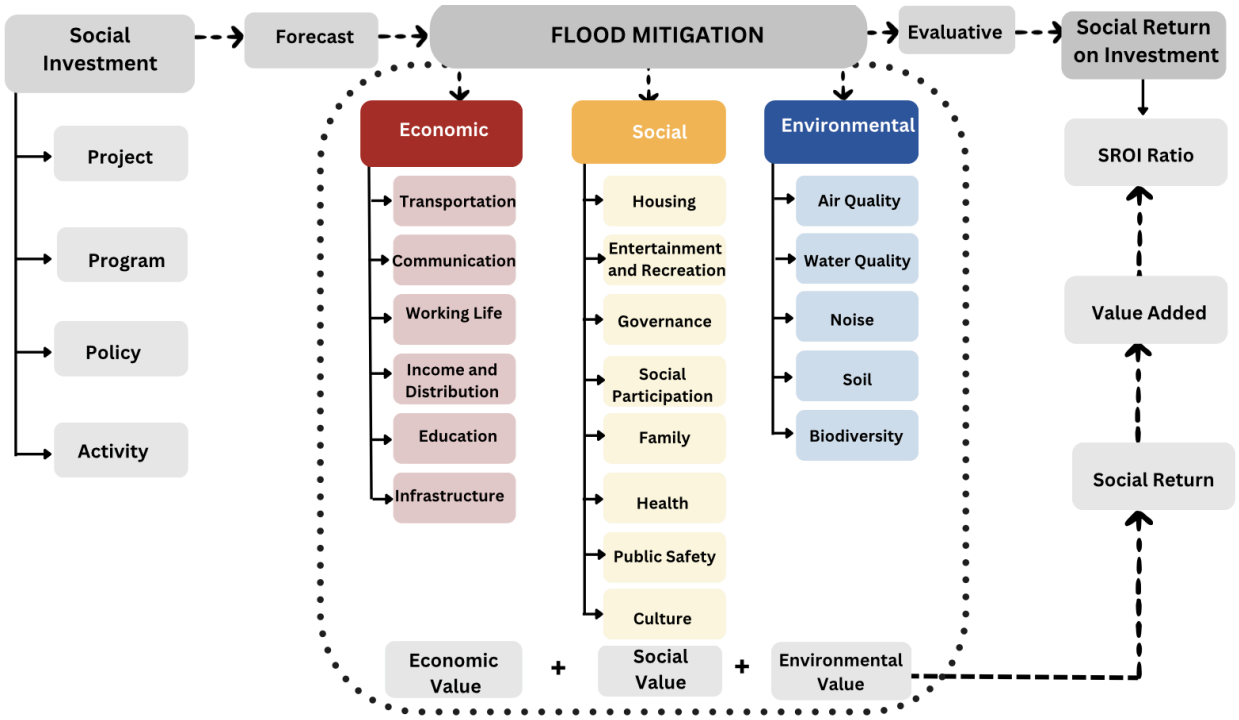

Figure 4: Instrument of SROI
Source: Own elaboration

Subsequently, a monetary valuation will be ascribed to each indicator to quantify its significance within the assessment framework. For example, within the social pillar, a health indicator was employed. The monetary value for this health indicator was determined by analyzing the cost savings associated with hospital treatments incurred by farmers. As a result, the overall value of each pillar will be derived from the aggregated values of the respective indicators, as detailed in Figure 5.

Indicator	Value of indicator
Health	Hospital treatment cost
Housing	Cost of repairing and rebuilding of destroyed and damaged house
Public security	Cost of replacing official documents (MyKad, MyKid, birth certificate).
Income & distribution	Value of loss of income, loss of income assistance, basic needs aid, agricultural assistance
Education	Cost of schooling assistance
Infrastructure	Cost of repairing and rebuilding destroyed and damaged infrastructure
Water quality	Cost of cleaning and treating polluted river

Figure 5: The value of indicator and pillar of SROI
Source: Own elaboration

The valuation of each indicator within every pillar will be customized to reflect the specific circumstances of the study. This flexibility allows the indicators to align closely with the research objectives and requirements. Consequently, not all indicators will be uniformly applied, nor will they possess identical values across different scenarios due to varying contextual factors. The SROI analysis provides a comprehensive overview of the total net present value impact, value added and SROI ratio for each investment made in activities, policies, projects or programs, as illustrated in Figure 6.

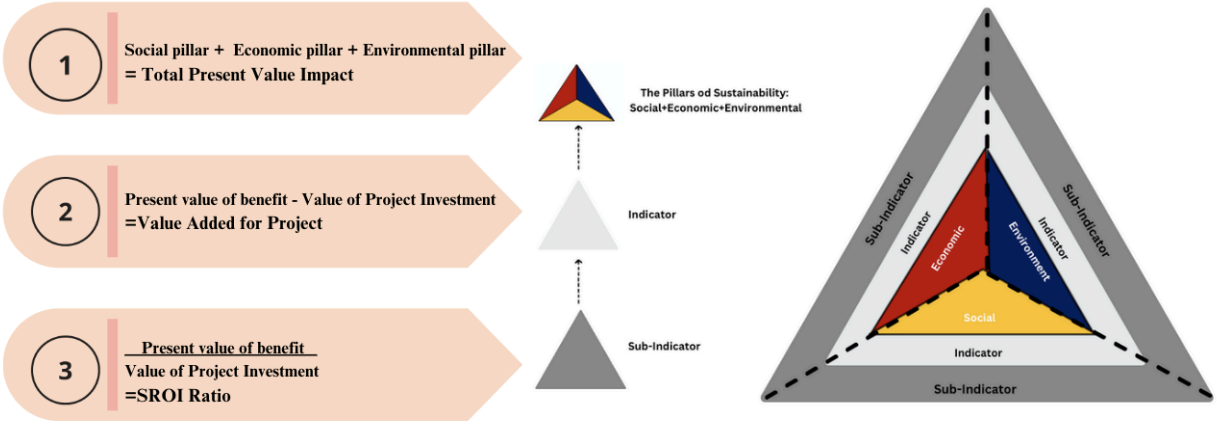

Figure 6: Social return on investment
Source: Own elaboration based on Ramli et al. 2019

Results and discussion

Integrating SROI in Quantifying The Sungai Muda Flood Mitigation Project

The SROI analysis is adept at capturing changes across the entire spectrum of the theory of change, from inputs to impacts, while providing a monetized ratio (Rotheroe & Richards, 2007; Emerson, 2003; Zappala & Lyons, 2009). While SROI serves as a valuable tool in various contexts, its application in the Flood Mitigation Project in Sungai Muda, Kedah is particularly pertinent. Engaging with intended beneficiaries as a key stakeholder group can not only help mitigate the impacts of flooding and enhance quality of life but also uncover insights and potential unintended consequences that might otherwise remain hidden. Furthermore, examining the pillars of sustainability: social, economic and environmental within the SROI framework is essential for comprehensively understanding the costs and benefits of the holistic approach promoted by the Sungai Muda Flood Mitigation Project.

The social value derived from the Sungai Muda Flood Mitigation Project encompasses the interrelated social, economic and environmental pillars, each reflecting the value derived from the indicators outlined in the Malaysia Well-being Index Report 2022 (DOSM 2024). The findings reveal that the project positively influences shared values across these pillars: economic

(41.4%), environmental (40.6%), and social (18%). Through the SROI analysis, the total net present value impact of the project is calculated at RM 4,892,641,540.00, encompassing social indicators (health, housing, public security), economic indicators (income distribution, education, infrastructure) and an environmental indicator (water quality). The total investment cost for the project is RM 1,001,760,000.00 (JPS 2016), indicating that the flood mitigation initiative has generated a value added of RM 3,890,881,540.00. The SROI ratio of 4.88:1 reflects the shared values across the social, economic and environmental pillars (refer to Figure 7), signifying that each ringgit invested in the project yields an additional RM 3.88 in social impact value.

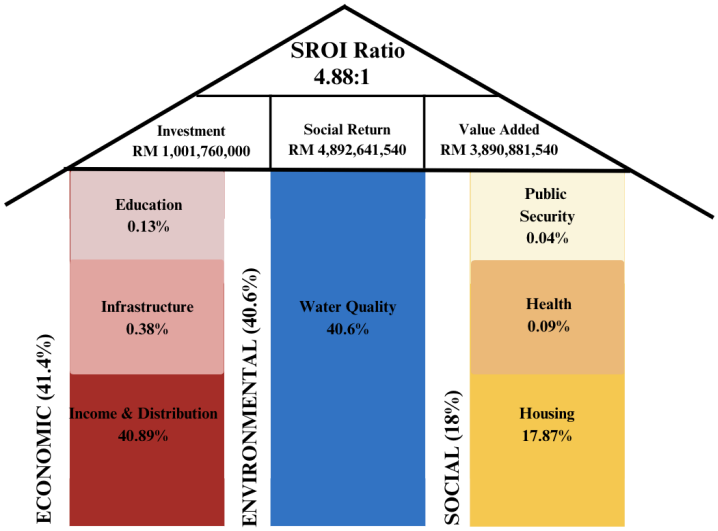

Figure 7: The shared value of Sungai Muda Flood Mitigation Project
Source: Source: Own elaboration

The SROI analysis highlights the substantial social value generated by the Sungai Muda Flood Mitigation Project. The SROI ratio indicates that the project is effectively contributing to positive social, economic and environmental outcomes, aligning closely with the SDGs (see Figure 8). This high return across diverse outcome areas underscores the project's capacity to drive meaningful impact while advancing SDG objectives, reflecting its value as a socially responsible and sustainable investment.

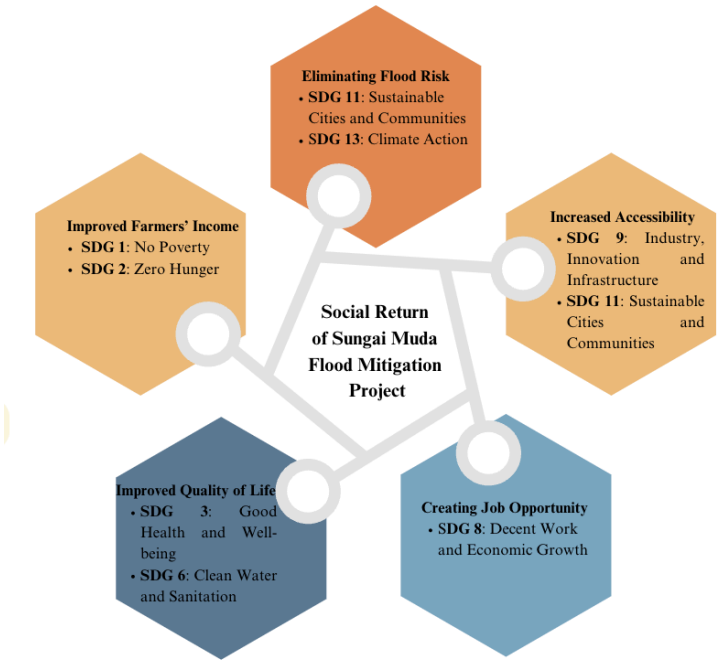

Figure 8: Impacts of Sungai Muda, Kedah Flood Mitigation Project
Source: Own elaboration

The SROI methodology is centered on quantifying the value of changes across social, economic and environmental elements by translating these changes into monetary terms whenever possible. Thus, conducting an SROI analysis effectively illustrates the value of social investments aimed at enhancing societal well-being, striving to measure the real impact of these investments accurately. Social value is generated through changes in the conditions that affect individuals, communities and society at large, encompassing various dimensions of life.

Conclusion

The convergence of sustainability and social investment in flood mitigation projects is essential for addressing contemporary economic challenges. The Flood Mitigation Project in Kedah exemplifies the potential of sustainable investment to deliver substantial social benefits in the realm of flood disaster management. In the current economic landscape, demonstrating the viability of social investments requires a clear articulation of their value proposition, which encompasses both financial effectiveness and social responsibility. The SROI methodology emerges as a robust and persuasive approach for conveying the efficiency and impact of social investments. By quantifying social value, SROI not only identifies potential cost-saving opportunities but also facilitates a comprehensive assessment and management of value. This framework represents a paradigm shift that broadens the understanding of value creation to encompass a diverse array of impacts, ultimately contributing to a more sustainable future.

References

Banke-Thomas, A. O., Madaj, B., Charles, A., van den Broek, N. (2015). Social return on investment (SROI) methodology to account for value for money public health interventions: a systematic review. *BMC Public Health 15*, 582.

Classens, M. (2015). What's in it for the volunteers? An SROI approach to volunteers' return on investment in the Good Food Markets. *Non-profit Management and Leadership 26* (2), 145-156.

Context. (2010). Social return on investment: A practical guide for the development cooperation sector: Retrieved from http://bigpushforward.net

Corvo, L., Pastore, L., Mastrodascio, M., & Cepiku, D. (2022). The social return on investment model: A systematic literature review. *Meditari Accountancy Research, 30*(7), 49–86.

Easterling. D., Rebekah R. Jacob, Ross C. Brownson, Debra Haire‐Joshu, Daniel A. Gundersen, Heather Angier, Jennifer E. DeVoe, Sonja Likumahuwa-Ackman, Thuy Vu, Russell E. Glasgow, Robert A. Schnoll. (2023). *Implementation Science Communications.*

Emerson, J. (2003). The nature of returns: A framework for analyzing the performance of social enterprises. California Management Review 45 (3), 36-51.

Gibbon, J., Dey, C. (2011). Developments in social impact measurement in the third sector: scaling up or dumbing down? *Social and Environmental Accountability Journal 31* (1), 63-72.

Gibson, J., Jones, A ., Travers, H., Hunter, E. (2011). Performative evaluation and social return on investment: potential in innovative health promotion interventions. *The Royal Australian and New Zealand College of Psychiatrists 19*: 553-557.

Hall, M., Millo, Y., Barman, E. (2015). Who and what really counts? Stakeholder prioritization and accounting for social value. *Journal of Management Studies 52* (7), 907-934.

Jabatan Pengairan dan Saliran, JPS. (2016). Maklumat Asas Pengurusan Lembangan Sungai Muda. Laporan tidak diterbitkan.

Kadel, R., Khedher, N. B., & Imbeau, D. (2022). The Six Stages of Social Return on Investment (SROI) Analysis. *Journal of Social Impact and Sustainability 14* (1), 45-67.

King, N. 2014. Making the case for sport and recreation services: the utility of social return on investment (SROI) analysis. *International Journal of Public Sector Management 27* (2), 152-164.

Krlev, G., Munscher, R., Mulbert, K. (2013). Social return on investment (SROI): State- of-the-Art and Perspectives. Retrieved from http://www.csi.uniheidelberg.de

Department of Statistics Malaysia, DSOM. (2024). Malaysia Well-being Index Report 2022. Retrieved from https://www.dosm.gov.my

Mertens, S., Xhaulflair, V., Maree, M. 2015. *Questioning the social return on investment (SROI).* Retrieved from: http://wwwiap-socent.be

Nicholls, J., Lawlor, E., Neizert, E. (2009). Seven principles for measuring what matters: a guide to effective public policy-making. The New Economics Foundation.

Nicholls, J., Lawlor, E., Neitzert, E., & Goodspeed, T. (2012). A guide to Social Return on Investment: The SROI Network.

Nicholls, J. (2017). *The landscape of social impact measurement: Trends and debates*. In Social Impact Measurement: Theory and Practice. Routledge.

Pathak, P., Dattani, P. (2014). Social return on investment: three technical challenges. *Social Enterprise Journal 10* (2), 91-104.

Purvis, B., Mao, Y., & Robinson, D. (2019). Three pillars of sustainability: In search of conceptual origins. *Sustainability Science 14* (3), 681-695.

Ramli, D.R.D., Aiyub, A., Arifin, K. (2019). *Nilai Pulangan Sosial Pelaburan*. Bangi. Penerbit UKM.

Rotheroe, N. and Richards, A. (2007). "Social return on investment and social enterprise: transparent accountability for sustainable development". *Social Enterprise Journal Vol. 3* (1), 31-48.

Social Value International. (2015). *Social Return on Investment (SROI) Network Guide*. Social Value International.

The New Economics Foundation. (2008). Measuring value: A guide to Social Return on Investment (SROI). Retrieved from: https://commdev.org

United Nations. (2016). *Transforming our world: The 2030 Agenda for Sustainable Development*. United Nations.

Zappala, G., Lyons, M. (2009). Recent approaches to measuring social impact in The Third Sector: An overview. *CSI Background Paper No. 6.*