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讓所有人純真地笑

— 真如老師

SEEDING HOPE • GREENING SUSTAINABILITY

A Social Return On Investment Study
For The Wanli District's
Coastal Reforestation
By Tse-Xin Organic Agriculture Foundation

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Asian Institute for Impact Measurement and Management

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**"WE DO WHAT OTHERS DON'T,
AND WHEN OTHERS ACT,
WE TURN TO WHAT STILL NEEDS DOING,
WHAT NO ONE ELSE WILL DO. "**

MASTER JIH-CHANG

LATE FOUNDER OF TSE-XIN ORGANIC AGRICULTURE FOUNDATION

FORWARD

Since its inception in 2015, the Tse-Xin Organic Agriculture Foundation has been at the forefront of promoting sustainable reforestation efforts in Taiwan. In collaboration with public sector entities and corporate partners, the Foundation has undertaken the ambitious task of planting 100,000 to 200,000 trees annually across the country. The primary objective is to restore coastal forests and establish protective belts to safeguard the nation's land. This initiative has progressively expanded to cover 18 coastal counties and cities, as well as the offshore islands of Penghu, Kinmen, and Matsu. By 2024, these efforts have resulted in the successful planting of 1.3 million trees, which are now gradually forming protective forests along Taiwan's coastlines and outlying islands.

The reforestation initiatives have not only contributed to environmental restoration but have also made a significant impact on local communities and individuals involved in afforestation-related activities. To objectively evaluate the effectiveness of resource utilization and assess the cost-benefit relationship between investments and value creation, the Foundation engaged Professor Chien-wen Mark Shen's team from the Asian Institute for Impact Measurement and Management Center at National Central University to conduct a Social Value Return on Investment assessment. The Wanli reforestation area in New Taipei City was selected as a sample site for this assessment, which aims to analyze the social impacts created by the project.

The findings from this evaluation will guide future expansions and applications of Tse-Xin's afforestation programs, offering valuable insights into the significant social impacts of coastal reforestation in Taiwan. These outcomes are anticipated to benefit organizations committed to ESG (Environmental, Social, and Governance) initiatives, and further contribute to sustainable development in our society.

Mu-Rong Su

Chief Executive Officer

Tse-Xin Organic Agriculture Foundation

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CHAPTER 1: INTRODUCTION

1.1 A Shrinking Taiwan

Taiwan, nestled on the western edge of the Pacific Ocean, boasts a 1,200-kilometer coastline. In 2012, Taiwan earned a spot on "Lonely Planet's" prestigious list of the world's top 10 tourist destinations, primarily owing to its picturesque eastern coast. The coastline stands as one of Taiwan's most valuable natural assets. Regrettably, due to improper utilization, it has become a source of environmental issues and safety concerns¹.

Historically, Taiwan's coastal forest belt was exceptionally extensive. However, post-war development such as coastal fisheries, industrial zones, harbor development, road networks, and wind power projects, have led to extensive human encroachment. This has caused the gradual reduction and fragmentation of the coastal forest belt, resulting in the loss of its crucial windbreaker and moisture-regulating functions in many areas².

According to the Geological Survey and Mining Management Agency of the Ministry of Economic Affairs, as revealed in their 2012 geological monitoring plan, at least 12 beaches and sandbanks in Taiwan are facing severe erosion. Continuous monitoring has shown that the northwest coast of Taiwan has receded by distances ranging from 20 to nearly 1,000 meters³. For example, the northeastern coast experiences erosion due to the construction of stabilization structures⁴. Historical tectonic activity and sediment transport contributed to shoreline advancements, but recent human activities have reversed this trend, leading to severe erosion in many coastal regions⁵. Additionally, storm surges, sea-level rise, and reduced river sediment discharge further complicate the issue, with periodic erosion and recovery cycles observed near river mouths⁶. Especially in surge-prone areas like the Yunlin coastline, Figure 1 shows the elevation difference between shore lands and storm surges in the absence of coastal defenses, designating it as a maximum-risk area. It demonstrates that the Yunlin coast has a wide inundation-prone scope. This issue extends beyond

¹ Jiang, Y. (2019, September 8). The beautiful coastline of Taiwan is being hollowed out. *Opinion@Common Wealth*. <https://opinion.cw.com.tw/blog/profile/466/article/8142>

² Chen, C. (2008). Restoration of Artificial Coastal Protective Forests. *Forestry Research Newsletter*, 15(1).

³ Tsao, T. (2016, December 11). The disappearing west coastline. *The China Times*. <https://www.chinatimes.com/newspapers/20161211000252-260114?chdtv>

⁴ Liang, T., Chang, C.-H., Hsiao, S., Huang, W., Chang, T.-Y., Guo, W., Liu, C., Ho, J.-Y., & Chen, W.-B. (2022). On-site investigations of coastal erosion and accretion for the Northeast of Taiwan. *Journal of Marine Science and Engineering*.

⁵ Hou, H. (2016). Marine environment around Taiwan coast. *Journal of Civil Engineering and Architecture*, 10.

⁶ Liu, J., Cai, F., Qi, H., Lei, G., & Cao, L. (2011). Coastal erosion along the west coast of the Taiwan Strait and its influencing factors. *Journal of Ocean University of China*, 10, 23-34.

environmental concerns; it is now posing a direct threat to the well-being and safety of coastal residents and their homeland. Overall, a multifaceted approach combining both soft and hard engineering solutions is necessary to manage Taiwan’s coastal erosion effectively.

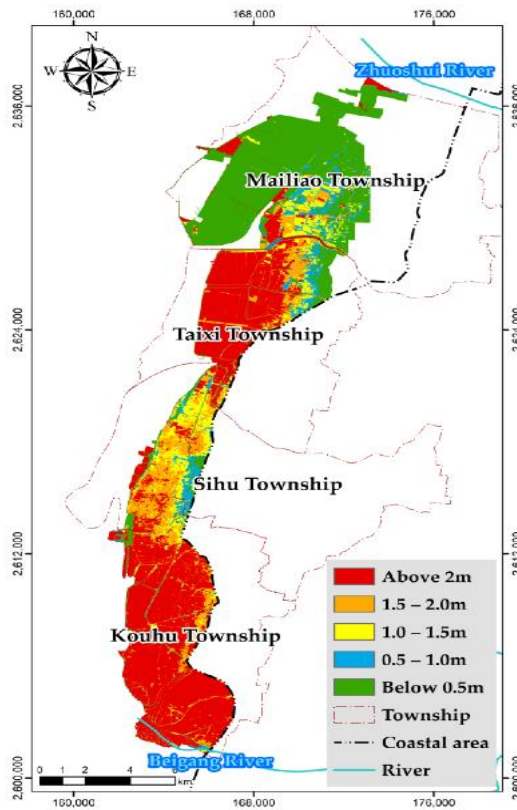


Figure 1. Coastal erosion problem in Yunlin, Taiwan⁷

Coastal afforestation is an effective solution to combat shoreline retreat. The roots of these trees firmly anchor the sand, while their canopy intercepts airborne sand, acting as a natural source of coastal sand replenishment. Even when faced with the forces of typhoons or monsoon waves that may wash away the coastline's sand, coastal forests play a vital role in slowing down this process and protecting the shoreline. This holistic approach offers a promising and sustainable path forward for the preservation of Taiwan's coastline⁸.

“Coastal afforestation is akin to divine work!” says Dr. Caihui Chen, a seasoned forestry expert from the Taiwan Forestry Research Institute. He characterizes the toils and tribulations of coastal

⁷ Huang, W.-P., Ye, C.-J., & Hsu, J.-C. (2022). Forecasts of the compound coastal erosion risks based on time-variant assessment: A case study on Yunlin Coast, Taiwan. *Sustainability*, 14(21), 14505.

⁸ Editor groups. (2015, April 1). Coastal Afforestation - Envisioning a Sustainable Taiwan. *Organic Attitude*, 26. <https://toaf.org.tw/about/magazine/147-magazine026/246-magazin03a026>

afforestation as "divine work," drawing from his years of observation and research⁹. The formidable hurdles coastal afforestation encounters result from a multitude of environmental factors, including scorching heat, relentless winds, airborne sand, salt spray, annual typhoon and monsoon strikes, and more. The intricately intertwined nature of these challenges paints a vivid picture of the harsh conditions that trees must conquer to thrive in such an environment. Even after succeeding in the initial planting stages, the challenges of follow-up maintenance loom large, shrouding the hard-earned success rates in a cloak of uncertainty. Historically, success rates languished at a mere 10%.

1.2 Meet Tse-Xin Organic Agriculture Foundation: Cultivating Sustainable Futures

In 1997, at a time when organic farming was relatively unknown, a compassionate Buddhist Master Jih-Chang was deeply saddened by the use of pesticide in farming and harming to living creatures. He foresaw the potential loss of land vitality and an impending food shortage crisis. In response, he embarked on a mission to "revive the earth and purify people's hearts," guiding his disciples in the practice of organic farming. From a humble piece of farmland, the Tse-Xin Organic Agriculture Foundation (TOAF) emerged. TOAF has since provided training and financial support to help farmers transition to organic farming. Committed to environmental restoration, improved livelihoods, and individual well-being, TOAF has evolved into one of Taiwan's most prominent and respected organic organizations¹⁰.

Recognizing the far-reaching consequences of deforestation on animals, air quality, global warming, and the severe impact of plastic waste on marine ecosystems, TOAF established a dedicated team (Figure 2) in tree-planting and has since played a pivotal role in the promotion of planting trees. This multifaceted effort encompasses on-campus educational initiatives and activities, the cultivation of seed volunteers, knowledge-sharing seminars with experts and scholars, and collaborations with government bodies, landowners, and enterprises.

⁹ Hung L. (2018, August 7). Challenging the Work of God. *Organic Attitude*, 35.
<https://toaf.org.tw/about/magazine/223-magazine035/674-magazine03c035>

¹⁰ Tse-Xin Organic Agriculture Foundation. (2024). About Us. Tse-Xin Organic Agriculture Foundation website.
<https://toaf.org.tw/en/about>



Figure 2. TOAF Afforestation Team

At first, the TOAF Afforestation Team focused on planting trees in non-coastal areas. However, recognizing the severe coastal issues, the foundation expanded its focus to coastal afforestation starting in 2013. Their inaugural project took place in 2015 at the Yunlin Taixi Sea Garden, an area left abandoned for 30 years due to its highly saline sand content and severe weather conditions. The team's unwavering efforts led to the success of planting 21,000 trees and an impressive 70% survival rate (Figure 3)¹¹. This achievement paved the way for subsequent projects, including the incumbent Wanli initiative.



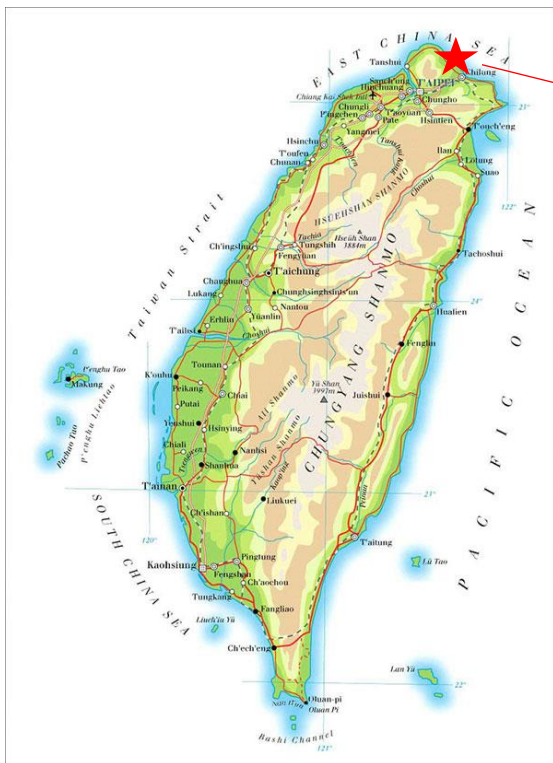
Figure 3. Yunlin reforestation site: Before & After

¹¹ Tse-Xin Organic Agriculture Foundation. (2016). *TOAF Annual Report 2016* (PP. 45-46). Tse-Xin Organic Agriculture Foundation. <https://toaf.org.tw/about/annual-report>

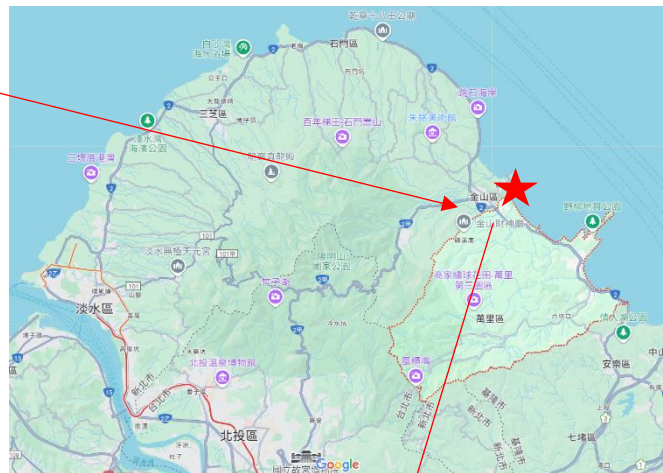
1.3 The Wanli Coastal Reforestation Project - Guarding the Coast at the Frontline

1.3.1 The reforestation challenges

Located at the northern forefront Taiwan, Wanli District of New Taipei City is surrounded by mountains on three sides and the sea on one side. 98% of the total area is hillsides, among which 96.4% are conservation area. In this project, the reforestation site is 2.5-hectare land located in the Dapeng Village, which is on the sea side (Figure 4).



Map of Taiwan



Location of Wanli District



Location of Dapeng Village

Figure 4. Geographic Location of Wanli District and Dapeng Village¹²

¹² Wanli District Office. (2017). *Statistical yearbook of Wanli District* [PDF file, Wanli District's Village Map]. Retrieved from

The coastal forest shown in the Figure 5 was previously destroyed by typhoon surges, necessitating replanting efforts to restore it. By maintaining the trees at the frontline of the coast, future typhoon surges can be mitigated, preventing them from invading and damaging the trees farther inland. This protective measure ensures the safety of the second and third lines of coastal forests, thereby consolidating the coastline. Consequently, it is critically important to protect and sustain the thousands of miles of coastline to safeguard these ecosystems and the communities that depend on them.

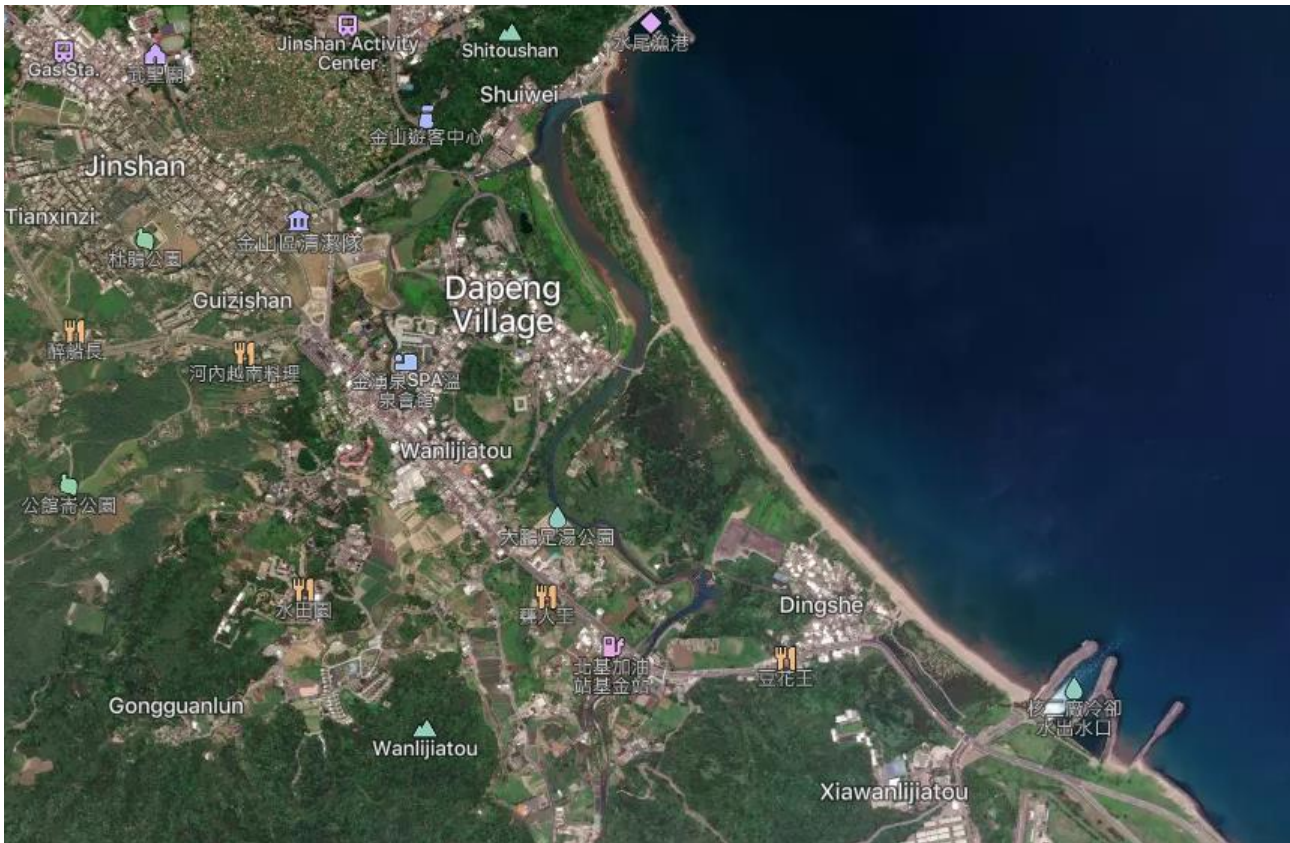


Figure 5. Restoration of Coastal Forests in Dapeng Village
Source: Mapcarta

For coastal afforestation, distinct geographical conditions pose unique challenges. The choice of tree species and planting methods must align with the specific conditions of each location. Initially, the team planted Casuarina trees, but the inflow of seawater from typhoon surges led to the drowning and death of the Casuarina trees under excessive salt exposure. In this site, the team conducted experiments with nearly 50 different tree species to identify those resilient to strong winds, sand burial, flooding, and saline conditions. This adaptive strategy not only aimed to restore the coastal

<https://www.wanli.ntpc.gov.tw/home.jsp?id=609b8db59eab22f7&act=be4f48068b2b0031&dataserno=f6f6ab05d7d18de8f069e85dced40a8d>

forest but also to establish a resilient green barrier capable of protecting the coastline from future environmental challenges. The above provides an overview of the Wanli Coastal Reforestation Project, abbreviated as the Wanli Project in the following sections. It sets the stage for understanding the project's goals, challenges, and innovative approaches to coastal reforestation.

1.3.2 The game changer - water-storing tree planter

In addition to dealing with harsh weather conditions, the combination of intense sunlight, low rainfall, and sandy soil with poor water retention results in a scarcity of water, which becomes the major challenge in retaining the saplings. To address the fundamental irrigation issue, Team Director Li-yi Cheng collaborated with Zen Zhou Co., a Taipei-based social enterprise, to develop water-storing tree planter. Each planter can store 15 liters of water and provide continuous hydration to two saplings for about a month.

The water-storing tree planter serves as more than a water source; it also protects the saplings. During summer time, the ground temperature around the sapling roots reaches approximately 75 degrees Celsius, while the area near the planter maintains a temperature of around 35 to 40 degrees. Additionally, the planter acts as a barrier against strong winds and prevents saplings from being buried in the sand, thereby mitigating the challenging climatic conditions (Figure 6)¹³. Beyond enhancing survival rates, saplings nurtured by the water-storing planter exhibit a growth volume two to three times larger than that of their counterparts under normal conditions, significantly expediting the growth of coastal forests.



Figure 6. The Game Changer - Water-storing Tree Planter

¹³ Tse-Xin Organic Agriculture Foundation. (2018 September 6). Rapid forestation of baby saplings - Water-storing tree planter. *Organic Attitude*, 39, <https://toaf.org.tw/about/magazine/234-magazine039/825-2018-11-06-08-02-14>

The water-storing tree planter is eco-friendly, crafted from biodegradable paper material that decomposes in about a year. Even during its decomposition, it serves the dual purpose of providing moisture and wind protection to the saplings and enriching the soil with nutrients. The initiative has yielded remarkable results, boasting an impressive 90% sapling survival rate. The tree planter secured the top prize of 2020 'Buying Power Award' hosted by the Ministry of Economic Affairs¹⁴.

1.3.3 Hotai Motor: The automobile leader to act in carbon emission offset initiatives

Hotai Motor Corporation is the major funder of the Wanli Project, showcasing its dedication to environmental conservation. As the exclusive distributor of TOYOTA and LEXUS vehicles in Taiwan, Hotai Motor holds a leading position in the automotive industry. The company consistently demonstrated leadership through its commitment to various Corporate Social Responsibility (CSR) activities aimed at supporting disadvantaged communities.

Acknowledging its commitment to environmental protection, Hotai Motor established the Environmental Management Committee in 2001, initiating a series of environmental activities in collaboration with dealers. In response to the imperative of reducing carbon emissions, in addition to introducing energy-saving vehicles, Hotai Motor launched 'One Car, One Tree' campaign in 2017. This campaign aims to offset carbon emissions by planting a tree for the car buyer for every new car sold. Through this initiative, Hotai Motor seeks to contribute to the local environment and ecology.

To effectively execute the campaign, Hotai Motor partnered with TOAF and the Forestry and Nature Conservation Agency (FANCA), rallying its corporate employees to actively participate in tree-planting initiatives. The FANCA, a division of the Ministry of Agriculture, is the government authority responsible for executing and overseeing afforestation and reforestation efforts in Taiwan. The campaign was well-received by its dealers and customers. Consequently, Hotai Motor continues the campaign and support tree-planting to this day for consecutive years.

1.3.4 The reforestation and afforestation activities and tree-planting educational programs

The Wanli Coastal Reforestation Project's reforestation and afforestation activities are integral to restoring the ecological balance and protecting the coastline. Conducted by the dedicated teams from TOAF and their business partners, such as Zen Zhou Co., these activities involve strategic planning and execution to ensure the successful establishment of coastal forests. The efforts begin with site preparation, including soil assessment and selection of native plant species best suited to the coastal environment. Following this, the actual planting of saplings is carried out meticulously, taking into account factors such as optimal planting seasons and spacing to maximize growth and

¹⁴ Tse-Xin Organic Agriculture Foundation. (2020 December 16). TOAF wins the 2020 Economic Department's Buying Power Award with 'Water-storing tree planter'. Tse-Xin Organic Agriculture Foundation. <https://toaf.org.tw/activity/collection/1082-109-buying-power>

survival rates. Regular maintenance and monitoring are crucial components of these activities, involving watering and mulching. These ongoing efforts are designed to combat coastal erosion, improve the overall resilience of the coastline against extreme weather events, and improve the living conditions of local residents.

Additionally, several tree-planting educational programs were organized, featuring participants from diverse backgrounds, including students (Figure 7), participants in the Buddhism Lamrim course, and members of Rotary Club district 3481. These programs included educational session, beach cleanup and tree-planting activities using the water-storing tree planter designed by Zen Zhou Co. The diverse participation not only fostered a sense of community but also raised awareness about the importance of coastal reforestation and environmental conservation.



Figure 7. Students Participated in Wanli Tree-planting Activity

CHAPTER 2: UNDERSTANDING AND APPLYING SROI

2.1 What is SROI?

When organizations endeavor to address specific social issues, the actions they take bring about transformative changes in the lives of beneficiaries. This is what we refer to as 'impact.' Social Return on Investment (SROI) serves as a framework employed to assess the impact of an intervention from the point of those who directly experience it or contribute to it, encompassing individuals and communities.

These changes inherently hold value for people, and thus, SROI applies financial proxies to non-market outcomes (i.e., the experienced changes) to quantify impact in monetary terms. It involves a comprehensive analysis of the resources invested in the intervention and compares the calculated impact value against the associated costs, resulting in a 'cost-to-benefit' ratio.

However, the purpose of SROI extends beyond the mere computation of a financial ratio to gauge the success of activities. The SROI calculation process yields valuable insights into how an organization fulfills its mission, offering strategic implications. This is because:

- Stakeholder engagement assumes paramount importance, as SROI calculations hold organizations accountable to their stakeholders rather than relying solely on program outputs for internal assessments¹⁵.
- It provides a nuanced narrative, akin to storytelling, elucidating the process by which changes are brought about and highlighting the varying degrees of significance attached to each change by different stakeholder groups¹⁶.
- SROI takes a holistic perspective on changes, encompassing both positive and negative, intended and unintended consequences, ensuring that all are accounted for in the value calculation¹⁷.
- Organizations can assess the impacts generated and make informed decisions on whether to modify, discontinue, or scale up their activities to maximize their societal contributions. In

¹⁵ Bellucci, M., Nitti, C., Franchi, S., Testi, E., & Bagnoli, L. (2019). Accounting for social return on investment (SROI). *Social Enterprise Journal*.

¹⁶ Mook, L., Maiorano, J., Ryan, S., Armstrong, A., & Quarter, J. (2015). Turning Social Return on Investment on Its Head: The Stakeholder Impact Statement. *Nonprofit Management and Leadership*, 26(2), 229-246.

¹⁷ Krlev, G., Münscher, R., & Mülbart, K. (2013). Social Return on Investment (SROI): state-of-the-art and perspectives - a meta-analysis of practice in Social Return on Investment (SROI) studies published 2002-2012. *Heidok*.

essence, it aids organizations in making informed decisions and judiciously allocating resources to better achieve their objectives¹⁸.

2.2 Why an SROI Study?

The SROI method has gained prominence as a crucial tool for evaluating the social impact of environmental projects. This methodology enables organizations to assess the social, economic, and environmental value generated by their initiatives. For example, the Jagapati Mangrove Conservation Program in Indonesia demonstrated that each Rp. 1 invested resulted in an impact of Rp. 8.13, highlighting the substantial environmental benefits of such projects¹⁹. Another study on flood recovery in Malaysia showed a positive return, with each RM 1 spent yielding RM 1.27 in social value²⁰. These findings underscore the effectiveness of SROI in not only validating the positive outcomes of environmental projects but also in guiding future investments and policy-making to ensure sustainable development.

The Wanli Project stands as a pivotal achievement for the TOAF Afforestation team, marking a profound turning point. This endeavor represents their second collaboration with the government sector. Through this project, the TOAF Afforestation team initiated their journey to excel in coastal afforestation. Moreover, Hotai Motor's unwavering support as the sole sponsor, coupled with dedicated public outreach and education on the significance of afforestation, has transformed this initiative into one of Taiwan's most celebrated CSR programs.

Since then, tree planting has become a popular CSR initiative in Taiwan, and TOAF has emerged as a respected name in the field of afforestation. Even the Team Director, Li-yi Cheng, earned the nickname "Tree-planting Queen" and found a place in elementary school textbooks. This project ignited TOAF's ambitious mission to plant one billion trees worldwide within ten years, as declared in 2018, leading to a partnership with the Mongolian government to combat sandstorms.

¹⁸ Moody, M., Littlepage, L., & Paydar, N. (2015). Measuring Social Return on Investment: Lessons from Organizational Implementation of SROI in the Netherlands and the United States. *Nonprofit Management and Leadership*, 26(1), 19-37.

¹⁹ Prasadi, O., Kurniawan, H., Saputra, R. R., Lestari, S. P., & Gunawan, A. (2023). Impact performance measurement using the SROI method (Social Return on Investment) in the Jagapati Mangrove Conservation Program (SIMANJA) PT. Pertamina Patra Niaga Integrated Terminal Cilacap, Indonesia. *Journal of Economics, Finance and Management Studies*.

²⁰ Teo, W. S., Seow, T. W., Radzuan, I. S. M., Mohamed, S., & Abas, M. A. (2021). Social Return on Investment (SROI) for government flood recovery project in Kuala Krai, Kelantan. *IOP Conference Series: Earth and Environmental Science*, 842(1).

While TOAF successfully completed the project with 11,900 trees planted, and significantly raised the woodland by 2 meters, which substantiates land preservation, meeting FANCA's initial request, there is an urge to assess the social impact of reforestation using a rigorous and disciplined approach, as maximizing social impact is also a mission of TOAF. Consequently, TOAF engaged the Asian Institute for Impact Measurement and Management (AIIMM), led by Prof. Chien-wen Mark Shen, who has directed three SROI reports for assurance, to conduct an SROI analysis. This analysis aims to scrutinize the effects of the afforestation efforts in the Wanli district through the lens of stakeholders, identifying avenues for future impact enhancements.

The study can potentially benefit TOAF in below areas:

1. Strategic planning: TOAF can utilize the results of the SROI analysis to inform strategic planning processes, ensuring that future initiatives align closely with stakeholder priorities and maximize social impact.
2. Stakeholder engagement: Armed with insights from the SROI analysis, TOAF can enhance stakeholder engagement strategies, fostering deeper connections with local communities and ensuring that their voices and needs are integrated into future project designs and implementation plans.
3. Securing sponsorship: The findings of the SROI analysis will serve as compelling evidence of the tangible social and environmental benefits generated by TOAF's afforestation initiatives, strengthening the organization's case when seeking sponsorship from potential donors and partners.
4. Maximizing impact: The SROI analysis provides a comprehensive view of the positive and negative impacts of TOAF's projects, allowing the organization to identify areas for improvement and optimize resource allocation. This ensures that TOAF's efforts are effectively directed towards activities that yield the greatest societal benefits.

2.3 Evaluative SROI Analysis: Methodology and Stages

There are two primary types of SROI analysis: 'forecast' SROI, which predicts the potential impact of an activity, and 'evaluative' SROI, which measures the actual changes it has generated. This project is classified as an evaluative SROI study because it aims to measure the actual changes and impacts generated by the initiative. Evaluative SROI studies are designed to assess the real-world outcomes of a project, in contrast to forecast SROI studies which predict potential impacts. Evaluative studies involve collecting data post-implementation to understand the value created and the extent to which the project's objectives were achieved. For instance, the Jagapati Mangrove Conservation

Program utilized an evaluative SROI to measure the social impacts of its reforestation efforts over a defined period, demonstrating a significant return on investment²¹.

A mixture of qualitative and quantitative research methodologies was adopted in this study:

- Qualitative workshop and one-on-one interview. We held workshop with full members from TOAF Afforestation team to gauge the needs for an SROI analysis and to determine scope of the study.
- We conducted one-on-one interviews with selected number of people from each stakeholder groups to explore all the changes that had occurred, and the causal relationships between one and another.
- Quantitative questionnaire distributed to incumbent stakeholders with the attempt to measure and account for changes, and other factors contributing or discounting them

To evaluate the social impact of the Wanli Project, we adhered to the eight principles (Figure 8) outlined in the SROI framework to ensure a comprehensive and accurate analysis. First, we involved stakeholders at every stage to capture diverse perspectives and ensure their needs and insights were integrated into the evaluation. We then focused on understanding what changes occurred as a result of the project, identifying and valuing the things that matter most to the stakeholders. By including only material outcomes, we ensured the analysis remained relevant and focused. We were careful not to over-claim by accurately attributing changes to the project and considering factors such as counterfactuals, attribution, displacement, and drop-off. Throughout the process, we maintained transparency by clearly documenting methodologies, assumptions, and calculations. We also verified the results through rigorous data collection and validation methods. Finally, we remained responsive to stakeholder feedback and adaptable to new information, ensuring the evaluation was both thorough and reflective of the true impact of the project.

²¹ Prasadi, O., Kurniawan, H., Saputra, R. R., Lestari, S. P., & Gunawan, A. (2023). Impact performance measurement using the SROI method (Social Return on Investment) in the Jagapati Mangrove Conservation Program (SIMANJA) PT. Pertamina Patra Niaga Integrated Terminal Cilacap, Indonesia. *Journal of Economics, Finance and Management Studies*.

1. Involve stakeholders
2. Understand what changes
3. Value the things that matter
4. Only include what is material
5. Do not over-claim
6. Be transparent
7. Verify the results
8. Be responsive

Figure 8. Eight Principles of SROI

The SROI analysis for the Wanli Project followed a structured six-stage process (Figure 9) to comprehensively assess its social impact. In Stage 1, the scope of the analysis was established, and key stakeholders were identified. Stage 2 involved mapping the outcomes by examining the relationships between inputs, outputs, and the resulting outcomes. During Stage 3, we gathered evidence of these outcomes and assigned them a monetary value to quantify their impact. Stage 4 focused on establishing the real impact by considering factors such as counterfactual, attribution, displacement, and drop-off to determine the true effect of the reforestation efforts. In Stage 5, we calculated the SROI ratio, which quantifies the social value generated per unit of investment, and performed a sensitivity analysis to test the robustness of our findings. Finally, Stage 6 involved reporting the results, using the insights to inform future projects, and embedding the findings into the organization's strategic planning to ensure continued value creation and stakeholder engagement. The following chapters will detail each of these stages: Chapter 3 will cover Stage 1, Chapter 4 will address Stage 2, and so on, providing a thorough examination of the SROI analysis process for the Wanli Project. The six stages of SROI are outlined in the "Guide to Social Return on Investment" by the Social Value UK²².

²² Social Value UK. (2012). *A guide to Social Return on Investment*. Retrieved from <https://socialvalueuk.org/wp-content/uploads/2016/03/The%20Guide%20to%20Social%20Return%20on%20Investment%202015.pdf>.

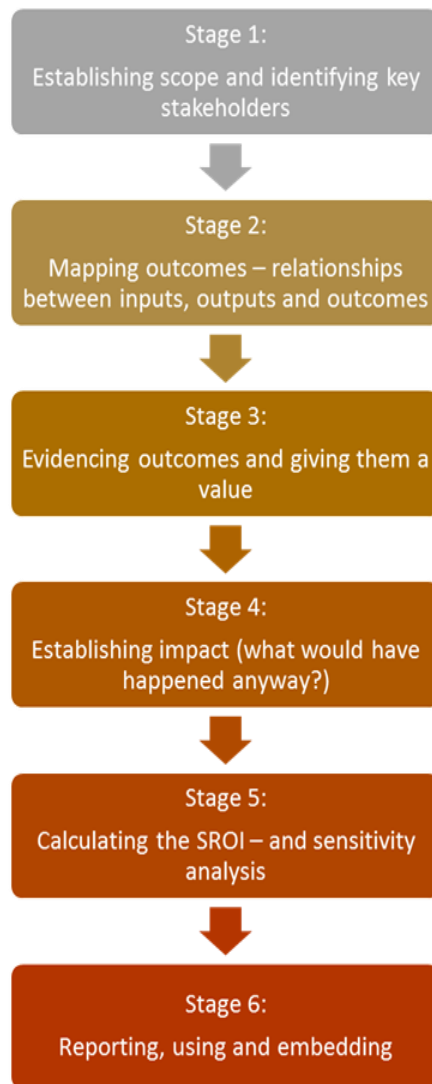


Figure 9. Six Stages of SROI Study

CHAPTER 3: ESTABLISHING SCOPE AND IDENTIFYING KEY STAKEHOLDERS

In this chapter, we'll explain how we identified stakeholders and how they were involved into the study. Stakeholders are people who either have been affected by or have contributed to the activity. Involving the stakeholders is the fundamental requirement of SROI as the methodology is based on measuring the changes experienced by these people to establish activity impact.

3.1 Establishing Scope

The Wanli Coastal Reforestation Project is a comprehensive 5-year initiative (2017-2022) focused on restoring and enhancing the coastal ecosystem in the Wanli district, specifically targeting the Dapeng section, parcels 2, 3, 4, and 6, in New Taipei City. The map shown in Figure 10 illustrates the location of Dapeng Village in the Wanli District, situated in the northern part of Taiwan. This geographical context is crucial for understanding the scope and significance of the Wanli Project. Dapeng Village, marked centrally on the map, lies near the coast and is surrounded by various other small villages and natural landmarks. The proximity to the coastline makes Dapeng Village particularly vulnerable to environmental challenges such as coastal erosion and sand encroachment.

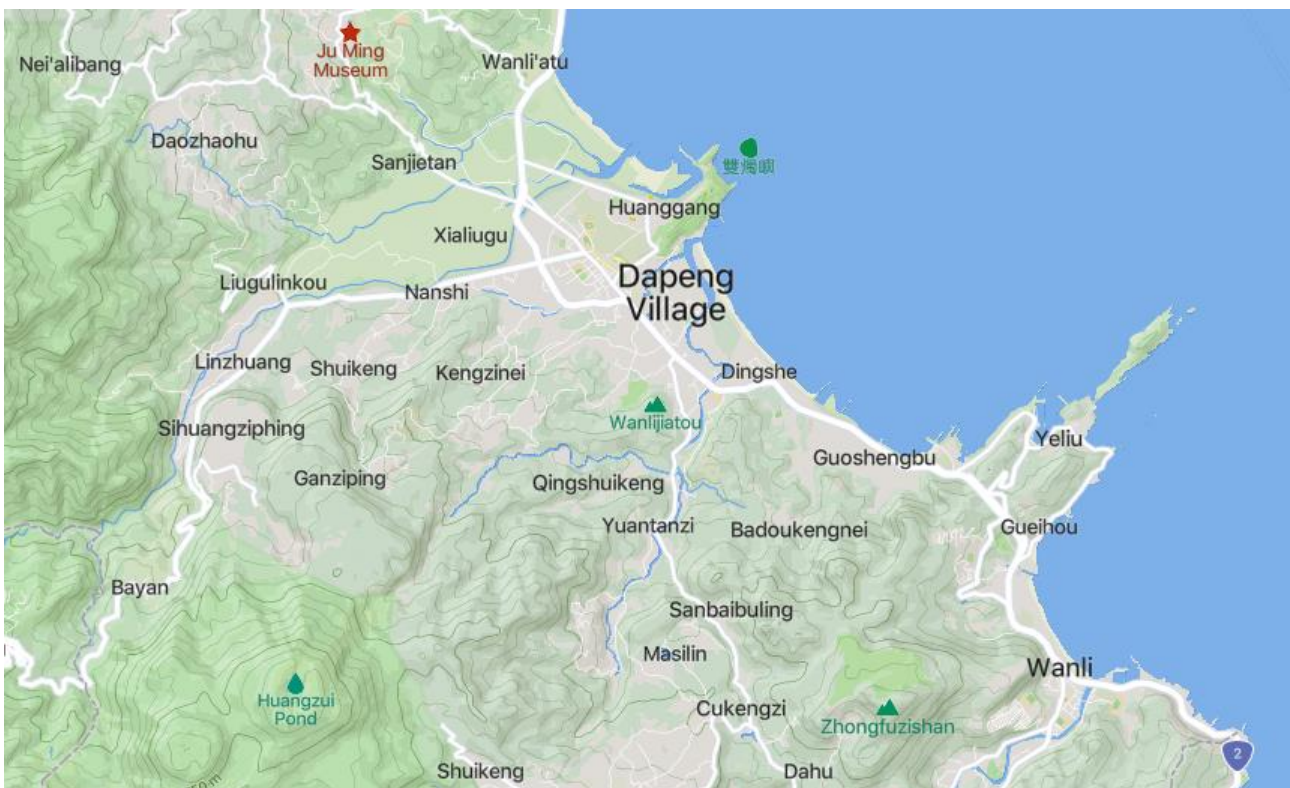


Figure 10. Location of the Dapeng Village

The satellite image shown in Figure 11 depicts Dapeng Village in the Wanli District of New Taipei City, Taiwan. Highlighted in yellow is the designated area for the Wanli Coastal Reforestation Project. This strategic location was chosen due to its critical need for ecological restoration and protection against coastal erosion. The project area, stretching along the coastline, faces significant environmental challenges such as sand encroachment and extreme weather events. This visual representation helps illustrate the scope and impact of the reforestation initiatives undertaken by the Tse-Xin Organic Agriculture Foundation (TOAF) and its partners. Recognizing that the successful establishment of coastal forests requires a considerable growth period, the project strategically planned for a timeline that acknowledges the 3-5 years needed for plants to mature and become resilient against environmental stressors. Over the five years, the project encompassed various activities including site preparation, selection and planting of native species, continuous monitoring and maintenance, and community engagement to ensure sustainability.



Figure 11. The Satellite Image of the Wanli Project

3.2 Identifying Stakeholder

The diagram (Figure 12) below illustrates the initial identification of potential stakeholders for the Wanli Project. This identification is based on comprehensive discussions with the TOAF team. The following provides further details on how we developed the stakeholder long list.

1. Initial Meeting and Explanation: We held an official meeting with all members of the TOAF Afforestation team to explain the importance of involving stakeholders in the SROI study. We emphasized that a comprehensive stakeholder analysis is crucial to accurately capturing all material

outcomes.

2. Team Brainstorming Session: During the meeting, each team member was asked to identify people and organizations directly and indirectly involved in the Wanli initiative, as well as those who may have experienced changes due to the initiative. We recorded all suggestions on a drawing board for a visual overview.

3. Stakeholder Input on Identifying Other Groups: We directly involved stakeholders who were experiencing outcomes by sharing the initial stakeholder list with them during follow-up sessions. We asked these stakeholders to provide feedback on whether the list was complete or if any groups were missing. We specifically prompted them with questions like, "Who else do you think is affected by this initiative?" and "Are there any groups we haven't considered who might also be experiencing changes?" This feedback led to the inclusion of additional groups, such as "visitors," who were not initially considered.

4. Further Analysis and Inclusion: We analyzed how these people and organizations were involved in the initiative and how their involvement or presence contributed to the activity's outcomes. Stakeholders' feedback on other potentially affected groups was instrumental in refining and finalizing the stakeholder long list.

Based on the stakeholder identification process and feedback from stakeholders experiencing outcomes, we categorized them into several groups to ensure comprehensive representation in the analysis. These groups include Local Visitors, Project Executors, the Sponsor (Hotai Motor), the Land Grantor (the Luodong Forest District Office (LFDO) of the FANCA under the Ministry of Agriculture), Education Participants, and Community Residents. Within these broad categories, further subgroups are specified to ensure a detailed understanding of the involved parties. For example, Project Executors include subgroups such as TOAF, Zen Zhou Co., Afforestation Team Members, and Supporting Individuals, while Education Participants encompass college students from BWFoCE and Taipei University, senior high school teachers and students, Lamrim course attendees, and members of Rotary Club District 3481. The LFDO at FANCA (hereafter abbreviated as the LFDO), categorized as a "Land Grantor," plays a critical role by authorizing the TOAF team to use government-owned coastal land for afforestation activities.

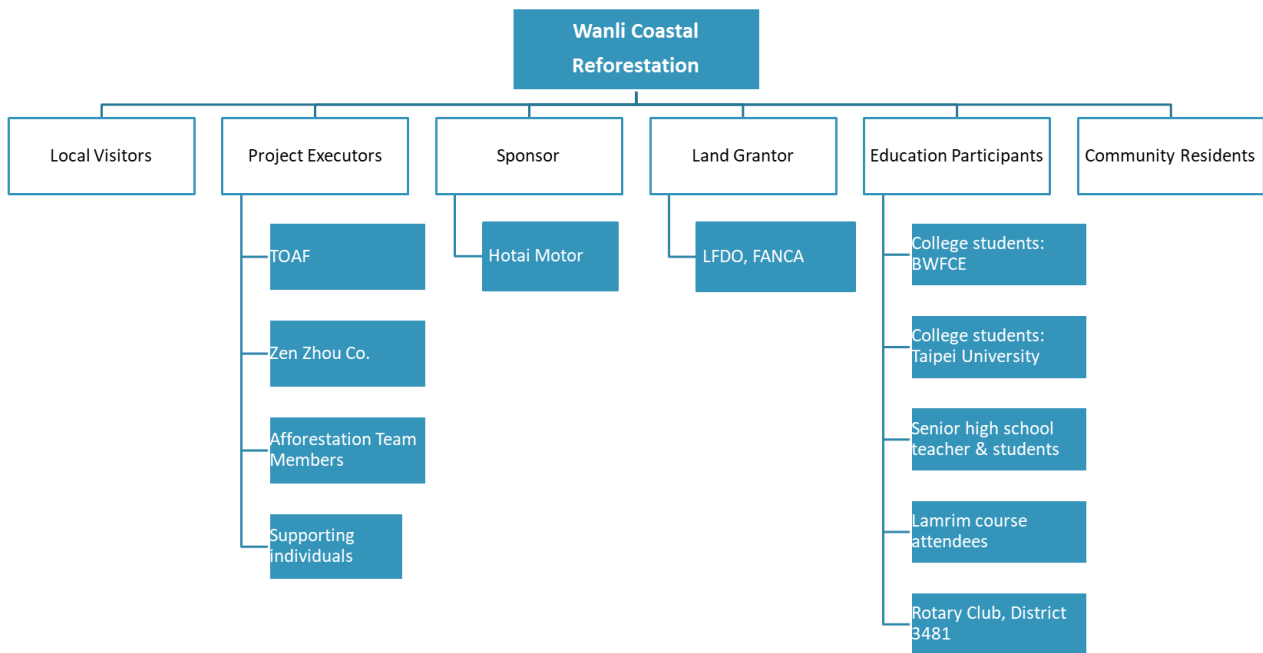


Figure 12. Initial Identification of Potential Stakeholders

The inclusion and exclusion of stakeholders for the Wanli Project were meticulously determined through detailed discussions with the project executor, Tse-Xin Organic Agriculture Foundation (TOAF), and guided by the AA1000 Stakeholder Engagement Standard (AA1000SES). This systematic approach ensured that all relevant parties were considered based on their dependency, responsibility, tension, influence, and diverse perspectives. The decisions were double-confirmed during the mapping outcomes stage to validate their relevance and importance. The AA1000 standard was considered for stakeholder identification because it offers a comprehensive framework for engaging stakeholders, which is crucial for achieving sustainable project outcomes. The standard emphasizes principles such as inclusivity, materiality, and responsiveness, ensuring that the engagement process is both thorough and effective²³. This approach helps in identifying stakeholders who are directly or indirectly affected by the project, thereby ensuring that their perspectives and concerns are appropriately addressed.

Community Residents and Educational Participants were included as key stakeholders in the Wanli Project due to their significant dependency on, influence over, and direct impact from the project's outcomes. Community residents are defined as those residing in Xiashe Section of Dapeng Village, Wanli District, New Taipei City, as this is the neighborhood directly affected by the project. Xiashe Section is a relatively mature community with 57% of the residents aged over 40 years old, and the gender distribution is even. The majority of residents have attained education levels equivalent to junior high or senior high school graduation. After conducting face-to-face interviews with the

²³ AccountAbility. (2015). AA1000 Stakeholder Engagement Standard 2015. Retrieved from <https://www.accountability.org/standards/>.

residents, we confirmed that it's a homogenous group. Community Residents are directly affected by the reforestation results, as the project aims to improve local environmental conditions by preventing sand from being blown into residential areas, thus enhancing their living conditions. Their dependency on the project's success makes their inclusion essential for understanding the local impact and ensuring community support and engagement.

Educational Participants, including college students from BWFoCE and Taipei University, Lamrim course attendees, and members of Rotary Club District 3481, were included due to their active participation in the educational tree-planting programs. We initially categorized two sub-groups of college students based on their respective sources. Students from BWFoCE were briefly exposed to pro-environmental information through their group activities. In the case of college students from Taipei University, as part of a liberal education course, TOAF Afforestation Team Director, Li-yi Cheng, was invited to give a lecture on climate change and the necessity of afforestation. Subsequently, the students participated in the on-site tree-planting program. During the outcome mapping process, we found that the changes experienced by both sub-groups were identical, regardless of respective origin or level of pre-exposed education. As a result, we decided to consolidate these two sub-groups into one "College Students" sub-group. Their involvement represents a critical influence on the project's success, as they help foster a culture of environmental responsibility and awareness. Additionally, their diverse perspectives and experiences provide valuable insights into the project's educational and community outreach components. Including these stakeholders ensures a comprehensive understanding of the project's broader social and educational impacts.

The "Senior high school teachers and students" sub-group was excluded from the SROI analysis for several reasons. Primarily, the duration of their participation in the tree-planting program was brief, which limited their exposure and potential impact from the initiative. During the outcome mapping stage, most participants from this sub-group reported no significant changes or only minimal changes resulting from their involvement. Additionally, attempts to contact many of the participants for follow-up interviews were unsuccessful, further limiting the ability to gather comprehensive data on their experiences and outcomes. These factors collectively contributed to the decision to exclude this sub-group from the SROI analysis, as their limited engagement and the lack of significant measurable impacts would not provide meaningful insights for the study.

In contrast, "Lamrim course attendees" and "Rotary Club, District 3481" were included as stakeholders because they demonstrated a more profound and sustained involvement in the tree-planting programs. The Lamrim course attendees, who participated in the tree-planting program as part of their course, exhibited significant pro-environmental behavior changes and diverse perspectives that contributed to the project's goals. Similarly, members of Rotary Club, District 3481, were actively involved in the educational tree-planting programs and showed a commitment to corporate social responsibility actions. Their participation and feedback provided valuable insights into the project's effectiveness and impact, justifying their inclusion in the stakeholder identification process.

Table 1 provides a summary of the stakeholder identification discussions for the groups of Community Residents and Educational Participants. It includes the specific AA1000 criteria used to assess each stakeholder group, indicating whether they were included or excluded from the study. Additionally, the table presents the rationale behind each decision, explaining why certain stakeholders were considered essential while others were deemed less relevant. By summarizing these elements, the table highlights the careful consideration and systematic approach used in identifying stakeholders, ensuring a comprehensive and effective analysis of the project's social return on investment.

Table 1. Stakeholder Identification for the Wanli Project: Community Residents and Educational Participants

Stakeholder Category	Sub-group	AA1000 Criteria	Inclusion/Exclusion	Rationale
Community Residents	-	Dependency, Responsibility, Influence	Inclusion	Directly impacted by the reforestation results.
Educational Participants	College students, BWFoCE	Dependency, Influence	Included and merged into: College Students subgroup	Participants of educational tree-planting activity.
	College students, Taipei University	Dependency, Influence	Included and merged into: College Students subgroup	Participants of educational tree-planting activity.
	Senior high school teachers and students		Exclusion	Short activity duration and reported no significant changes post-activity.
	Lamrim course attendees	Dependency, Influence, Diverse Perspectives	Inclusion	Participants of educational tree-planting activity.
	Rotary Club, District 3481	Dependency, Influence	Inclusion	Participants of educational tree-planting activity.

The LFDO under the Ministry of Agriculture was included as a stakeholder due to its critical role in providing regulatory oversight and support for the Wanli Coastal Reforestation Project. As the authority responsible for managing the government-owned coastal land, the LFDO granted TOAF permission to use the land for afforestation. Their involvement ensures that the reforestation activities comply with governmental regulations and policies. Their influence and responsibility over the project area make them an essential stakeholder in this project.

Hotai Motor, the sole sponsor of the Wanli Project, was included due to its significant financial and strategic support. Their commitment to funding the project highlights their responsibility and

influence in driving the project's goals and sustainability efforts. By including Hotai Motor, the project acknowledges the company's pivotal role in enabling the reforestation activities and their broader corporate social responsibility initiatives.

Local visitors, including swimmers and bikers who frequent the beaches along the Wanli coastline, were excluded as stakeholders. Although they use the project area, their visits are infrequent, and they are generally unaware of the reforestation efforts. Moreover, their lack of direct engagement and negligible changes experienced as a result of the project justify their exclusion from the stakeholder analysis.

TOAF, as the project owner and executor, was included due to its central role in planning, managing, and executing the Wanli Coastal Reforestation Project. Their responsibility and influence over all aspects of the project make them a crucial stakeholder. Including TOAF ensures that the project's execution, strategies, and outcomes are thoroughly evaluated and aligned with the overarching environmental goals.

Zen Zhou Co. was included as a stakeholder due to its role as a joint developer and manufacturer of water-storing tree planters, which are vital to the project's success. Their involvement in providing essential resources and expertise underscores their dependency, responsibility, and influence in achieving the project's objectives. Including Zen Zhou Co. helps evaluate the impact of their contributions and the effectiveness of the innovative planting solutions.

Afforestation Team Members were included due to their direct involvement in the ongoing execution of the reforestation activities. Their hands-on work and commitment to the project are critical for its success. By including these team members, the analysis captures the practical challenges and achievements of the on-ground implementation efforts, reflecting their responsibility and influence.

Supporting Individuals, initially considered for inclusion, were ultimately excluded from the stakeholder analysis. Although they contributed by directing films, creating visual aid boards, and supporting afforestation efforts, their involvement consisted of only three individuals. This small number made their impact on the project relatively insignificant. Additionally, the changes experienced by these individuals were deemed very minor, further justifying their exclusion from the SROI analysis. This decision ensures that the focus remains on stakeholders with substantial and material contributions to the project's outcomes.

Table 2 provides a summary of the stakeholder identification discussions for other stakeholder groups involved in the Wanli Project. It includes the specific AA1000 criteria used to assess each stakeholder group, indicating whether they were included or excluded from the study. Additionally, the table presents the rationale behind each decision, explaining why certain stakeholders were considered essential while others were deemed less relevant.

Table 2. Stakeholder Identification for the Wanli Project: Other Stakeholders

Stakeholder Category	Sub-group	AA1000 Criteria	Inclusion/Exclusion	Rationale
LFDO	-	Dependency, Responsibility, Influence	Inclusion	Provided regulatory oversight and support, and granted land for afforestation.
Hotai Motor	-	Dependency, Influence	Inclusion	Sole sponsor of the project.
Local visitors	-		Exclusion	Infrequent visitors, unaware of the reforestation efforts.
Project Executors	TOAF	Responsibility, Influence	Inclusion	Project owner.
	Zen Zhou Co.	Dependency, Influence	Inclusion	Joint developer and manufacturer of water-storing tree planters.
	Afforestation Team Members	Responsibility, Influence	Inclusion	Key team members responsible for executing the project activities.
	Supporting Individuals		Exclusion	Insignificant number of individuals and changes.

Table 3 presents a detailed summary of the stakeholder groups included in the SROI analysis of the Wanli Project. The identification and inclusion of these stakeholders were based on thorough discussions with the TOAF team and the application of AA1000 criteria, ensuring that all relevant parties were considered. The population numbers for each stakeholder group were carefully estimated to provide a reliable representation of those affected by or involved in the project. For example, according to the 2017 Wanli District Office statistical yearbook, Dapeng Village is the fourth largest in the district, with a population of 3,120. Three coastal neighborhoods exist in Dapeng Village. Xiashe Section, with an estimated population of 572, is one such neighborhood directly impacted by the reforestation project. Notably, the population is listed as 1 for some stakeholder groups because the impact measurement is directed towards the organization as a whole, rather than individual members. This approach ensures that the analysis captures the collective impact on these institutional stakeholders. Our methodology underscores the importance of stakeholder engagement and materiality in social value analysis, adhering to the principles set forth by Social Value International. By including these stakeholders, the analysis aims to capture a holistic view of the project's impact, ensuring that all significant changes and contributions are accounted for.

Table 3. Stakeholder Groups Included in the SROI Analysis

Stakeholder Category	Sub-group	Population
Community Residents	-	572
	College students	160
Educational Participants	Lamrim course attendees	40
	Rotary Club, District 3481 (Org.)	1
LFDO	-	1
Hotai Motor	-	1
Project Executors	TOAF (Org.)	1
	Zen Zhou Co. (Org.)	1
	Afforestation Team Members	5

3.3 Deciding How to Involve Stakeholders

The engagement plan for the Wanli Project is designed to ensure that all stakeholders are adequately involved at each stage of the project. This involvement will help to gather qualitative and quantitative data necessary for the SROI analysis, ensuring that the outcomes reflect the experiences and perspectives of all stakeholder groups.

The methods of involvement for the Wanli Project's stakeholders include a combination of one-on-one interviews (conducted on-site, by phone, or online), official meetings, workshops, and surveys. One-on-one interviews, official meetings, and workshops were used to collect qualitative data, which is crucial for understanding the changes experienced by stakeholders due to the project. Open-ended questions will be used to gather in-depth insights into stakeholders' experiences and value perceptions. These methods allow for the identification of both intended and unintended outcomes, as well as the positive and negative outcomes on different stakeholders. One-on-one interviews, flexible in format, will be employed for all stakeholders to capture specific information. For institutional stakeholders like LFDO and Hotai Motor, formal meetings were used to ensure structured and detailed communication. Workshops will be organized for project executors, including TOAF and afforestation team members, to provide a platform for active engagement and detailed feedback. Surveys will be used for all stakeholders to gather quantitative data on the amount of change, the duration of outcomes, the relative importance of these changes, and related impact data.

To ensure a representative sample, we used a random sampling technique to select stakeholders from each group. Below is a detailed explanation of how we selected representatives from each potential stakeholder group and the respective number of contacts made.

- Community residents: A random sampling approach was used during on-site visits. We

randomly selected residents within the community to participate in one-on-one interviews. This approach ensured that a diverse range of community members was represented, capturing varying levels of engagement and differing experiences with the project.

- Educational participants: Representatives from sub-groups were selected through collaboration with sub-group leaders. The leaders assisted with the random selection of respondents, ensuring a balanced representation across different educational institutions and participant types (e.g., college students, senior high school teachers and students). We conducted one-on-one phone interviews with those selected, using contact lists provided by the leaders.
- Other Stakeholder Groups (e.g., Sponsor Hotai Motor, LFDO, Project Executors): We aimed to engage all key representatives within these groups due to their relatively smaller sizes. This included one-on-one interviews with each identified individual, such as the project leader and coordinators from Hotai Motor, the initiative leader from LFDO, the General Manager of Zen Zhou Co., supporting partners, and full members of the TOAF Afforestation team.

Throughout the Wanli Project, stakeholder engagement was conducted at regular intervals to monitor progress and gather feedback, and a final engagement took place at the end of the project to evaluate outcomes and collect final feedback. Adequate resources were allocated to ensure effective stakeholder engagement, including financial, human, and technological resources necessary for conducting surveys, organizing workshops, and facilitating meetings. To establish trust and transparency, the results of the stakeholder engagement were communicated back to participants, which included an action plan outlining how the feedback would be incorporated into the project. Regular updates and reports were provided to ensure stakeholders remained informed and involved throughout the project.

In line with Principle 1: Involve Stakeholders, the SROI analysis of the Wanli Project emphasizes the crucial role stakeholders play in contributing to data collection and analysis. Stakeholders' involvement ensures that the outcomes measured, the methods of measurement, and the valuation processes accurately reflect the changes they experience. At various stages of the analysis, stakeholders are engaged to provide insights and inform critical decisions. This includes identifying the scope and relevant stakeholders, defining outcomes, developing and validating indicators, and collecting outcome data. Stakeholders must be involved in determining which outcomes to measure, the extent of these outcomes, and the valuation of inputs. Their involvement is essential for understanding the relative importance of different outcomes and estimating what might have happened without the activities. By actively involving stakeholders, the analysis remains transparent, robust, and reflective of their perspectives, ensuring that the social value created by the project is accurately accounted for.

CHAPTER 4: STAGE 2 – MAPPING OUTCOMES

In this chapter, we will cover the second stage of the SROI analysis by providing a detailed account of the key components that form the foundation of the Wanli Coastal Reforestation Project. Principle 2: Understand What Changes was considered at this stage to articulate how change is created and evaluate this through evidence gathered, recognizing positive and negative changes as well as those that are intended and unintended. This stage involves outlining the inputs invested in the afforestation project, the outputs resulting from these investments, and the outcomes derived by various stakeholder groups. By mapping these elements, we aim to provide a comprehensive understanding of how resources were utilized, what immediate outputs were achieved, and how these efforts translated into meaningful changes for stakeholders. The following sections detail each of these components, laying the groundwork for a thorough SROI analysis.

4.1 Valuing Inputs

Inputs are the resources required to deliver an activity, including both financial and non-financial. The contributions made by each stakeholder that are necessary for the activity to happen.

Table 4 provides a summary of the inputs for the Wanli Project, detailing the stakeholder categories, sub-groups, types of inputs, and their financial values in New Taiwan Dollars (NTD)²⁴. Community Residents did not contribute any input value as they did not directly participate in the project activities despite living nearby and noticing the project. For all educational participants, the time cost is calculated based on the minimum hourly wage publicized by the Ministry of Labor. This includes college students, Lamrim course attendees, and members of the Rotary Club, District 3481. The Luodong Forest District Office provided land and saplings, with the saplings' value based on market value and the financial value of the reforestation land based on the announced land value publicized by the New Taipei City government for the year 2017. Hotai Motor made a substantial financial contribution of NTD 3,570,000, which covered all essential project needs. This included the cost of water-storing tree planters for Zen Zhou Co. and the time and management costs of the TOAF Afforestation team. As a result, the input type for Zen Zhou Co. and Afforestation Team Members is recorded as time, with a financial value of 0 NTD because these were included in Hotai Motor's sponsorship. Additionally, TOAF invested NTD 185,000 to enhance its team members' professional capabilities by enrolling them in arborist courses and obtaining licenses. The total financial value of the inputs for the Wanli Project amounts to NTD 4,835,780, highlighting the significant resources committed by various stakeholders to ensure the success of the project.

²⁴ As of June 8, 2024, 1,000 New Taiwan Dollar (NTD) is equivalent to approximately 30.86 United States Dollars (USD).

Table 4. Summary of Inputs

Stakeholder Category	Sub-group	Type of Inputs	Financial Value (NTD)
Community Residents	-	-	0
Educational Participants	College students	Time	106,400
	Lamrim course attendees	Time	26,600
	Rotary Club, District 3481	Time	53,200
LFDO	-	Land and Saplings	894,580
Hotai Motor	-	Money	3,570,000
Project Executors	TOAF	Money	185,000
	Zen Zhou Co.	Time	0
	Afforestation Team Members	Time	0
		SUM	4,835,780

4.2 Clarifying Outputs

The outputs of the Wanli Coastal Reforestation Project encompass a range of tangible results achieved over the course of five years. The TOAF Afforestation team successfully planted and nurtured 11,900 saplings across a 2.5-hectare area in Dapeng Village. The project also involved rigorous site maintenance and management, with a total of 100 visits made to the site. These visits were conducted weekly during the first year to ensure the saplings' successful establishment, and monthly from the second year onward to maintain and manage the site effectively. Additionally, the project included the 'One Car, One Tree' campaign, which linked the purchase of new vehicles to tree planting and included tree-planting activities for Hotai Motor employees (Figure 13). This initiative promoted environmental stewardship among both customers and staff, fostering a culture of sustainability within the organization. Additionally, the project conducted 10 educational tree-planting programs designed for educational participants (Figure 14). These programs engaged students, Lamrim course attendees, and Rotary Club members in hands-on environmental activities, providing them with valuable learning experiences and fostering a deeper understanding of environmental conservation. By involving diverse groups in these educational programs, the project aimed to raise awareness and encourage active participation in reforestation efforts. These outputs collectively demonstrate the project's comprehensive approach to reforestation, community involvement, and sustainability education.



Figure 13. Hotai Motor's Employees Participated in the Wanli Project



Figure 14. Educational Participants

The Wanli Project has made significant strides since its inception, transforming vast stretches of barren coastline into thriving green spaces. The images shown in Figure 15 illustrate the progress of the initiative over the years. Initially, the site faced severe challenges with sand encroachment threatening the coastal ecosystem and nearby residential areas. The strategic installation of barriers and the meticulous planting of native species have played crucial roles in stabilizing the sand dunes. Over time, the reforested areas have shown remarkable growth, with dense vegetation now flourishing where there was once barren sand. The progression depicted in these images highlights the effectiveness of the reforestation efforts, showcasing the dense greenery that now acts as a

natural barrier against sand and wind. This transformation not only enhances the ecological resilience of the coastline but also significantly improves the local environment by preventing sand from being blown into residential areas. The evolving landscape is a testament to the dedicated efforts of TOAF and its partners in restoring and protecting the coastal ecosystem.



Figure 15. Evolution of the Wanli Coastal Reforestation Site (photos taken from different angles)

4.3 Describing Outcomes

4.3.1 Gather information about outcomes

To understand the outcomes that occurred for each stakeholder group, the methods of involvement employed included one-on-one interviews, official meetings, and workshops. These methods ensured comprehensive data collection, facilitating a thorough understanding of the project's impact on diverse stakeholders. For example, Figure 16 and Figure 17 depict one-on-one interview sessions with community residents, a crucial part of the stakeholder engagement process for the Wanli Project. The interview setting is informal and comfortable, allowing the elderly participants to feel at ease. Many of the residents, who lack higher education, were accompanied by neighbors to assist in understanding the interview questions. This support was essential to ensure accurate and comprehensive data collection, reflecting the true impact of the project on the community. The interviewer was seen actively engaging with the participants, using a laptop to document responses, highlighting the blend of traditional and modern methods in the data collection process. While the interviewer engages with an elderly participant, others wait their turn, seated in a local community office. Despite the communal setting, each interview was conducted individually to ensure thorough and personal feedback from each resident. This method allows for an organized and efficient gathering of outcome information, accommodating the residents' needs and schedules. A sample of the interview questions is included in **Appendix A**.



Figure 16. One-on-One Interview with Community Residents



Figure 17. Individual Interviews with Community Residents in Queue

Table 5 provides a detailed summary of the stakeholder groups involved in the SROI analysis of the Wanli Project. The table lists each stakeholder category, along with their respective sub-groups, total population, and the number of individuals interviewed. For the Community Residents category, 29 out of a population of 572 were interviewed. Educational Participants included 19 college students, 5 Lamrim course attendees, and 1 member from Rotary Club, District 3481, all of whom were interviewed. The institutional stakeholders, such as LFDO and Hotai Motor, each had 1 representative interviewed. However, for Hotai Motor, three top executives were interviewed as they are the key persons responsible for funding the Wanli projects. In the Project Executors category, TOAF had 1 representative interviewed. Zen Zhou Co. also had 1 representative interviewed, reflecting their involvement in developing and manufacturing water-storing tree planters. Additionally, 3 members of the Afforestation Team were interviewed out of a total of 5, given their direct involvement in executing the project activities. These interviews, conducted through various methods such as one-on-one sessions, official meetings, and workshops, aimed to gather qualitative data for mapping outcomes and identifying well-defined outcomes. This comprehensive approach ensured a thorough understanding of the project's impact on each stakeholder group, capturing the diverse perspectives and experiences of those involved.

Table 5. Stakeholder Groups, Population, and Number Interviewed for the SROI Analysis

Stakeholder Category	Sub-group	Population	No. Interviewed
Community Residents	-	572	29
Educational Participants	College students	160	19
	Lamrim course attendees	40	5
	Rotary Club, District 3481	1	1
LFDO	-	1	1
Hotai Motor	-	1	3
Project Executors	TOAF	1	1
	Zen Zhou Co.	1	1
	Afforestation Team Members	5	3

4.3.2 Create chains of events

Outcomes represent the changes that stakeholders undergo as a result of an activity's intervention. Given the diversity among stakeholders, outcomes can range from positive to negative, intended or unintended, and sometimes even beyond what was initially envisioned. This variability underscores the critical importance of involving stakeholders in the evaluation process to capture a comprehensive and accurate picture of the activity's impact. To ensure all experiences were accounted for, every outcome mentioned during interviews was included in the initial step of creating the chain of events, regardless of how frequently they were reported. We intentionally chose not to exclude any outcomes, even those mentioned by only 1 or 2 stakeholders. This approach ensured that the analysis considered all potential impacts, both common and uncommon, providing a complete picture of the activity's effects on stakeholders. The inclusion of outcomes in the SROI analysis was determined during the materiality assessment, as detailed in Section 5.3 of the report.

By pinpointing the causal links between outcomes, we establish the chains of events. For each stakeholder group, we identify well-defined outcomes that articulate specific changes affecting stakeholders, offering the best opportunities to enhance or diminish value. Well-defined outcomes facilitate informed resource allocation decisions aimed at maximizing social value. Creating a chain of events involves several critical steps. First, dependencies are identified by linking outcomes based on an initial assessment of dependency. Next, the chain of events is consolidated by ensuring that it is logical and streamlined, removing any redundant or overlapping outcomes. It is also crucial to recognize when to stop extending the chain, understanding when the chain has reached a natural conclusion and no further dependencies are apparent. Finally, the chain must be made representative for the group by ensuring that it accurately reflects the experiences and outcomes of the stakeholder group as a whole.

After establishing several chains of events that encompass both positive and negative outcomes for all stakeholder groups, we reviewed the analysis for completeness. Ensuring a complete chain is essential to minimize the risk of excluding any negative outcomes that some stakeholders may have experienced. To achieve this, we conducted a thorough review to verify that all stakeholder groups were adequately represented in the analysis. This process also confirmed that outcomes for all stakeholders, including those who did not experience significant changes, were considered and documented in the report. In the following sections, the chains of events for each stakeholder group will be discussed individually. To better illustrate the chains of events in the table, we present only the primary sequences for each chain.

Let's begin our discussion with the Community Residents stakeholder group. Table 6 illustrates the chain of events leading to well-defined outcomes for the Wanli Project regarding this group. For instance, improved environmental comfort was achieved as the environment became greener, making the surroundings aesthetically pleasing. This change motivated residents to spend more time outside, thereby increasing physical activity. Improved air quality, due to reduced airborne sand, led to better respiratory health and less time spent on house cleaning. The afforestation efforts also created a natural barrier, enhancing the community's sense of safety.

The tree-planting activities and education programs held in the community fostered a sense of environmental responsibility and commitment, as evidenced by comments like, "Watching the efforts of these people motivates me to get involved in environmental protection activities." This sense of ownership and responsibility led to increased environmental protection actions and advocacy for pro-environmental behaviors.

Residents' feedback further supports these outcomes. For example, one resident mentioned, "As there's more green scenery in the community, it makes me feel comforted and relaxed," highlighting the impact of the greener environment. Another noted, "There's less sand in the air, so the air became cleaner and fresher. It's easier to breathe; I feel more relieved and healthier," demonstrating the improved air quality and respiratory health. One community member shared, "In the past, I had to clean my house often. Now, there's a significant reduction in both sand and wind, particularly in the winter," illustrating the reduced frequency and time spent on house cleaning.

Additionally, the presence of the afforestation area has fostered a greater sense of safety among residents. One resident stated, "The reforest area captures sand, leading to its gradual elevation over the years, effectively forming a natural barrier against powerful sea waves. Much of the trash brought in by these waves gets intercepted by the elevated terrain. This is particularly noticeable after the typhoon season, as it significantly facilitates the cleanup of beach litter, thereby saving a lot of time and energy, and enhancing sense of safety when walking on the beach."

Initially, some negative outcomes were identified, such as feeling unsafe due to increased visitors and snakes. However, these outcomes were reported by only one resident and were deemed insignificant during the survey stage, so they were not included in the final analysis. Further discussion will be provided in Section 5.3: Examining Materiality.

These varied outcomes underscore the importance of stakeholder engagement in capturing the full spectrum of the project's impact. Overall, the well-defined outcomes identified for the Community Residents include improved environmental comfort, increased physical activity, improved respiratory health, reduced frequency and time spent on house cleaning, increased sense of safety, aroused environmental behavior intentions, taking environmental protection actions, increased sense of commitment for the community, and advocating pro-environmental behaviors. "Feeling unsafe" is the well-defined outcome that was later excluded during the examination of materiality.

Table 6. Chain of Events Leading to Well-defined Outcomes for Community Residents

Well-defined Outcomes	Chain of Events
Improved environmental comfort	Environment becomes greener → improves the aesthetic and pleasing appearance of the surroundings → improved environmental comfort
Increased physical activity	Less airborne sand → air quality improves → willing to go out and exercise more in the community area or along the coastline → increased physical activity
Improved respiratory health	Less airborne sand → air quality improves → breathing becomes easier, feeling less irritated → improved respiratory health
Reduced frequency and time spent on house cleaning	Less airborne sand → less sands get into the house → reduced frequency and time spent on house cleaning
Increased sense of safety	Afforestation land forms a natural barrier and naturally accumulating debris brought by sea waves → streamlines beach cleanup efforts → increased sense of safety
Aroused environmental behavior intentions	Seeing people coming to the community, planted trees and cleaned-up coastline for my community → recognized with their environmental protection work → aroused environmental behavior intentions
Took environmental protection actions	Seeing people coming to the community, planted trees and cleaned-up coastline for my community → recognized with their environmental protection work → took environmental protection actions
Increased a sense of commitment for the community	Seeing people coming to the community, planted trees and cleaned-up coastline for my community → sensing own responsibility for the community → increased a sense of commitment for the community
Advocated pro-environmental behaviors	Experienced and enjoyed the benefits of coastline afforestation → grew conviction to environmental protection action → advocated pro-environmental behaviors
Feeling unsafe	1. More trees → more visitors and snakes → feeling unsafe 2. More trees → coastline became narrower → feeling unsafe

The educational participants, specifically college students, experienced a range of outcomes from their involvement in the Wanli Project. For instance, many students reported a shift in their purchasing habits towards more environmentally friendly products. One student shared, "When I buy products, if there's organic options, I'd certainly go for it," indicating an increased environmental awareness and conscientious decision-making influenced by the project. The project also increased

students' willingness to engage in pro-environmental behaviors. A student expressed, "I care about the environment more now, so I'm willing to sign up for future beach cleanup activities," showing a proactive attitude towards environmental conservation. Advocacy for environmental behavior and tree-planting became evident as students took initiative in their communities. One student noted, "I want to hold training and courses in tree planting and beach cleaning in my school club for every six months, this will help others to gain knowledge and understanding about these topics." This highlights the students' drive to spread awareness and involve more people in environmental activities. Students also took concrete pro-environmental actions, such as reducing consumption and using public transportation more frequently. However, not all outcomes were entirely positive. A sense of powerlessness was noted by some students, feeling daunted by the scale of environmental challenges. One student expressed, "I'm only able to do my part but can't change the bigger environment. I feel powerless." This negative outcome was not included in the end, because only one student mentioned this sentiment. Further discussion will be provided in Section 5.3.

Table 7 summarizes the chain of events leading to well-defined outcomes for the College Students. Overall, the well-defined outcomes identified for this stakeholder group include purchasing environmentally friendly products, participating in other environment-related activities, enhancing empathy for the natural environment, increasing willingness to engage in pro-environmental behaviors, advocating for pro-environmental behavior and tree-planting, and taking pro-environmental actions.

Table 7. Chain of Events Leading to Well-defined Outcomes for College Students

Well-defined Outcomes	Chain of Events
Purchased environmentally friendly products	Gained knowledge about climate change, afforestation, and shocked by the amount of litter in the beach → heightened environmental awareness → purchased environmentally friendly products
Took part in other environment related activities	Heightened environmental awareness → started paying attention in environmental issues → took part in other environmental related activities
Enhanced empathy to natural environment	Gained knowledge about the importance, necessity and challenges of coastal afforestation → started paying attention to the trees in surrounding and related environmental news → enhanced empathy to natural environment
Increased willingness to engage in pro-environmental behaviors	<ol style="list-style-type: none"> 1. Gained knowledge about coastal afforestation → heightened environmental awareness → increased willingness to engage in pro-environmental behaviors 2. Recognized with coastal afforestation → increased willingness to engage in pro-environmental behaviors 3. After planting the saplings → feeling a sense of self-worth → increased willingness to engage in pro-environmental behaviors
Advocated for pro-environmental behavior and tree-planting	<ol style="list-style-type: none"> 1. Gained knowledge about coastal afforestation → heightened environmental awareness → wanted more people to recognize the importance of it → organized lectures in my school club → advocated for environmental behavior and tree-planting

	2. Planted the trees → felt a sense of self-worth → wanted to share with my friends about it → advocated for environmental behavior and tree-planting
Took pro-environment actions	<ol style="list-style-type: none"> 1. Gained knowledge about coastal afforestation → heightened environmental awareness → took pro-environment actions 2. Recognized with coastal afforestation → took pro-environment actions 3. Have a sense of commitment → took pro-environment actions
Feeling powerless	Daunted by the challenges ahead → feeling powerlessness

Table 8 summarizes the chain of events leading to well-defined outcomes for Lamrim Course Attendees. For instance, heightened environmental awareness led participants to take pro-environment actions, as illustrated by a stakeholder's feedback: "I feel connected to Mother Earth, and want to do something about it. So I started saving electricity and water, recycled papers, and reduce plastic ware consumption." This sense of connection also motivated actions like not buying new clothes, but instead wearing second-hand ones. Similarly, increased environmental awareness inspired attendees to participate in other environment-related activities, as reflected in the comment: "I continuously follow what TOAF is doing, and think what it does is very meaningful so I joined more of their activities." Additionally, advocacy for environmental protection encouraged participants to influence their family and friends, evidenced by remarks like, "I tell my kids the importance of planting trees, and I encouraged my kid to plant his own potted plant." Overall, the well-defined outcomes identified for the Lamrim Course Attendees include taking pro-environment actions, taking part in other environment-related activities, and encouraging family members or friends to take pro-environment actions.

Table 8. Chain of Events Leading to Well-defined Outcomes for Lamrim Course Attendees

Well-defined Outcomes	Chain of Events
Took pro-environment actions	<ol style="list-style-type: none"> 1. Heightened environmental awareness → took pro-environment actions 2. Increased willingness to Took pro-environment actions → took pro-environment actions 3. Feeling connected to the nature more → took pro-environment actions
Took part in other environment related activities	Heightened environmental awareness → participated in other environment related activities → took part in other environment related activities
Encouraged family members or friends to take pro-environment actions	<ol style="list-style-type: none"> 1. Advocated environmental protection and tree-planting → encouraged family members or friends to take actions 2. Heightened environmental protection awareness → encouraged family members or friends to take actions 3. Grew consensus with afforestation work → encouraged family members or friends to take actions

Table 9 illustrates the chain of events leading to well-defined outcomes for the Rotary Club, District 3481. The recognition of the importance of afforestation increased the members' sense of environmental awareness, leading them to take actions within their organization. This, in turn, encouraged the organization to engage in corporate social responsibility actions. As one stakeholder noted, "I initiated other tree-planting activities in northern Taiwan in two years," reflecting the ongoing impact of the initial engagement. Additionally, gaining knowledge and positive experiences from the afforestation activities allowed the Rotary Club to share and exchange these experiences with their network peers, facilitating and expanding the scope of their organizational networking. This was exemplified by a member's effort, "I invited district leaders from overseas to share their afforestation experiences, and in the event, I shared Wanli's case." Overall, the well-defined outcomes identified for the Rotary Club, District 3481, include encouraging the organization to engage in corporate social responsibility actions and facilitating and expanding the scope of networking for the organization.

Table 9. Chain of Events Leading to Well-defined Outcomes for Rotary Club, District 3481

Well-defined Outcomes	Chain of Events
Encouraged organization to engage in corporate social responsibility actions	Recognized the importance of afforestation → increased sense of environmental awareness → took actions in organization → encouraged organization to engage in corporate social responsibility actions
Facilitated and expanded scope of networking for organization	Gained knowledge and positive experience → shared and exchanged experiences amongst network peers → facilitated and expanded scope of networking for organization

SROI aims to demonstrate the value created for the people or communities directly affected by the project. Funders and grantors are typically seen as enablers rather than primary beneficiaries, so their outcomes are not the central focus of the analysis, and hence the chain of events is not necessary to investigate. We still conducted interviews with the LFDO and Hotai Motor because they are the land grantor and funding supporter of the Wanli project. We confirmed that LFDO did not need to have well-defined outcomes identified. However, Hotai Motor experienced some significant changes as a result of their involvement.

Table 10 outlines the chain of events leading to well-defined outcomes for Hotai Motor as a result of their involvement in the Wanli project. For example, the "One Car, One Tree" campaign and continued sponsorships significantly enhanced the company's reputation. This initiative also fostered greater environmental awareness and participation in public welfare activities. Employee engagement improved as they recognized the company's environmental efforts, leading to better communication and efficiency. For instance, an interviewee mentioned, "Since employees volunteered in the tree-planting activities, cross-functional team communication has improved,

leading to smoother operations. Consequently, they enjoyed work furthermore.” Similarly, the campaign garnered strong support and cooperation from dealers, further boosting engagement. A top executive noted, “In the past, it’s always a challenge to come up with a promotion campaign that won the full support from all dealers. But this campaign is an exception. Dealers recognize it and were committed to rolling it out.” Overall, the well-defined outcomes identified for Hotai Motor include facilitated corporate pro-environmental practices, enhanced corporate reputation, enhanced employee engagement, and enhanced dealer engagement.

Table 10. Chain of Events Leading to Well-defined Outcomes for Hotai Motor

Well-defined Outcomes	Chain of Events
Facilitated corporate's pro-environmental practices	Corporate became more aware and committed in environmental protection → participated in more public welfare related activities → facilitated corporate’s pro-environmental practices
Enhanced corporate reputation	<ol style="list-style-type: none"> 1. Corporate introduced the “One Car, One Tree” campaign → sponsored TOAF → continued the sponsorship annually → won car owners’ recognition → enhanced corporate reputation 2. Recognized the importance of afforestation to reduce carbon emission → engaged in public education → enhanced corporate reputation
Enhanced employee engagement	<ol style="list-style-type: none"> 1. Corporate sponsorship → employees recognized with corporate’s deeds → enhanced employee engagement 2. Corporate organized employees to volunteer in tree-planting activity, thus created opportunity for employees’ networking → facilitated cross-functional teams’ communication → improved work efficiency → enhanced employee engagement
Enhanced dealer engagement	Corporate introduced the “One Car, One Tree” campaign → dealers were very satisfied with the campaign and gave full support to implementing it → won recognition and cooperation from dealers → enhanced dealer engagement

The chains of events shown in Table 11 illustrate the steps that led to each well-defined outcome for TOAF. For instance, the team's competencies and effectiveness were significantly enhanced through training and the development of innovative water-storing tree planters, which greatly reduced resource use and expedited afforestation time. An interviewee mentioned, “In the beginning, we didn’t know much about coastal afforestation, just knew it’s extremely challenging. The Wanli initiative is a major breakthrough for us. It’s where we sought expert’s support, experimented different tree species, successfully developed the water-storing tree planter etc. There’s been so many trials and errors. At the end, the whole team obtained arborist license, and there’s a significant enhancement in team’s competencies and effectiveness.”

Enhanced team resilience was achieved through training and expert support, which helped the team overcome initial challenges. One expert noted, “The expert has 40-yr of experience, so we learnt the dos and don’ts to avoid wasting organization resources and thus not defeating team resilience.”

The project also led to increased media exposure, enhancing the organization’s publicity and gaining new sponsorship opportunities. As one stakeholder highlighted, “The initiative won the '2018 Brave Deeds' Award, bringing us extra media exposure, so attracted new sponsors, enabling us to plant more trees.” Additionally, the positive working relationship with FANCA and expert groups provided TOAF with more opportunities to collaborate with the government and academic sectors, resulting in valuable partnerships. An example shared by a team member was, “Later on, we worked with FANCA on which species of crops have higher amount of carbon emission, and then we rolled out to 400 farmers.”

Overall, the well-defined outcomes identified for TOAF include enhanced team’s competencies and effectiveness, enhanced team resilience, gained organization resources, and gained government and academic partnerships.

Table 11. Chain of Events Leading to Well-defined Outcomes for TOAF

Well-defined Outcomes	Chain of Events
Enhanced team’s competencies and effectiveness	<ol style="list-style-type: none"> 1. Enhanced knowledge and skills through training and on-the-job training → acquired arborists licenses → enhanced team’s competencies and effectiveness 2. Developed water-storing tree planters → greatly reduced resources spent on water and manpower → greatly expedited afforestation time by 4 times → enhanced team’s competencies and effectiveness 3. More sponsorship opportunities → learnt how to cope with different enterprises → enhanced team’s competencies and effectiveness
Enhanced team resilience	Team encountered many challenges in the beginning → took training, sought expert groups support → improved team’s tenacity to challenging situations → enhanced team resilience
Gained organization resources	The project gained media exposures → increased organization publicity → gained organization resources (in terms of new sponsorships)
Gained government and academic partnerships	Positive working experience with FANCA and expert groups → more opportunities to co-op with government sector and academic fields → gained government and academic partnerships

Table 12 outlines the chain of events leading to well-defined outcomes for Zen Zhou Co. For example, the development of the water-storing tree planter was a significant challenge that required overcoming various obstacles. This successful development enhanced the team’s core competencies, as reflected in a stakeholder’s feedback: “It’s extremely challenging to develop the water-storing tree

planter because it has to be 100% organic and decompose without polluting nature. Nevertheless, the development team relentlessly worked on it. The development success significantly enhanced the team's capabilities and bolstered their confidence.” Additionally, the success in developing the tree planter increased the company’s exposure and publicity, leading to gained organization resources. A stakeholder mentioned, “We got more new clients, including FANCA and AUO Display Plus. We also won the Golden Pin Design Award in 2021. We are now developing an upgraded version of the tree planter to be used in other clients’ projects.” Overall, the well-defined outcomes identified for Zen Zhou Co. include enhanced team’s core competencies and gained organization resources.

Table 12. Chain of Events Leading to Well-defined Outcomes for Zen Zhou Co.

Well-defined Outcomes	Chain of Events
Enhanced team’s core competencies	Faced great challenge in developing the water-storing tree planter → overcame and succeeded in the development → team members’ capability and resilience increased → enhanced team’s core competencies
Gained organization resources	The development success increased company exposure and gained publicity → gained organization resources (including new clients and businesses)

During the Wanli project, Afforestation Team Members experienced significant changes through their involvement. Increased pro-environment commitment developed from a heightened awareness and direct involvement in environmental protection. An interviewee mentioned, “When planting trees along the coastline, I saw a significant amount of garbage, drawing my attention to pressing ocean-related concerns. The plastic bags becoming ingested by marine animals and birds, and turned into microplastics entering into human food chain. So I reduced plastic consumptions in daily lives.”

Other positive outcomes included a sense of self-worth, improved communication skills, enhanced social contribution, a sense of achievement, and improved stamina. However, there were also negative outcomes such as deteriorated physical conditions due to the physically demanding nature of the work. One team member reported, “I got injured while moving heavy materials, so I can no longer lift heavy stuffs now.”

In summary, Table 13 highlights the identified well-defined outcomes for the Afforestation Team Members, which include increased pro-environment commitment, a sense of self-worth, improved communication skills, enhanced social contribution, a sense of achievement, improved stamina, and deteriorated physical conditions. "Feeling powerless" and "Improved stamina" are two well-defined outcomes that were later excluded during the examination of materiality. Further discussion on this will be in Section 5.3.

Table 13. Chain of Events Leading to Well-defined Outcomes for Afforestation Team Members

Well-defined Outcomes	Chain of Events
Had a sense of self-worth	Performed duties as required → ensured trees' growth → saw own contributions to addressing global issues → had a sense of self-worth
Improved communication skills	1. Performed duties as required → overcame shyness → improved communication skills 2. Encountered problem → got advice from community residents, and realized the necessity to build rapport → improved communication skills
Enhanced social contribution	Acquired expertise in coastal afforestation → gained critical success in Wanli Project → gained public exposure, won award recognition → became prominent figure → engaged in general public's awareness drive → enhanced social contribution
Increased pro-environment commitment	Gained knowledge about afforestation → saw large amount of garbage along coastline → increased awareness in environmental protection → started taking pro-environment actions → increased pro-environment commitment
Enhanced a sense of achievement	Performed duties as required → saw the benefits brought to the participants → enhanced a sense of achievement
Improved stamina	Tried to overcome the physical demand of coastal trees management → improved stamina
Deteriorated physical conditions	Job required to move heavy things → got body injury → deteriorated physical condition
Feeling powerless	Daunted by the challenges ahead → feeling powerlessness
Improved stamina	Tried to overcome the physical demand of coastal trees management → improved stamina

Based on the value map, the project involved various stakeholder groups, each contributing uniquely to the outcomes achieved. Community residents, as beneficiaries, did not directly participate in the project activities or provide inputs. Instead, they benefited from the project's outputs, such as the planting of 11,900 saplings, which resulted in outcomes previously identified in the chain of events, including improved environmental comfort, enhanced respiratory health, and an increased sense of safety due to the enhanced local environment.

Educational participants, including college students and Lamrim course attendees, actively contributed their time by participating in one of the 10 educational tree-planting programs organized by the project. Their involvement played a vital role in supporting hands-on environmental activities, resulting in various outcomes as listed in Tables 7, 8, and 9. For example, the Rotary Club, District 3481, participated as an organization by providing time and organizational resources to support environmental initiatives. Their involvement included coordinating members' participation in tree-planting activities and promoting corporate social responsibility, which fostered pro-environmental actions and reinforced the organization's commitment to sustainability.

TOAF, in collaboration with its partner Zen Zhou Co., received funding from Hotai Motor and took responsibility for planning, organizing, and executing all project activities. Their efforts included coordinating the planting of 11,900 saplings, overseeing more than 100 site visits for sapling and site management, and conducting 10 educational tree-planting programs. These initiatives led to outcomes for the TOAF organization, such as increased environmental protection actions, improved local environmental conditions, and enhanced community engagement in sustainability initiatives, as detailed in Table 11. Additionally, the outcomes specific to the Afforestation Team Members are listed in Table 13. Meanwhile, Zen Zhou Co. served as a joint developer and manufacturer of water-storing tree planters for the project. Their primary input was the time dedicated to fulfilling orders from TOAF. Due to their significant efforts and commitment to ensuring the project's success, they also experienced the outcomes listed in Table 12.

Hotai Motor and LFDO were the major funders of the Wanli Project. Hotai Motor, as the primary sponsor, provided \$3,570,000 in funding, covering the majority of the costs associated with tree planting and educational activities. This substantial financial input facilitated the comprehensive implementation of the project, leading to significant outcomes such as an enhanced corporate reputation and increased employee engagement due to their visible contributions to environmental sustainability. The outcomes achieved by other stakeholders also surpassed Hotai Motor's expectations, strengthening their commitment to environmental initiatives. Motivated by this successful experience, Hotai Motor has continued to support similar tree-planting projects. Meanwhile, LFDO contributed to the project by providing land and financial resources for seedlings, valued at \$892,500. Their support was essential for enabling the afforestation activities. The outcomes achieved by other stakeholders exceeded LFDO's expectations as well, significantly amplifying the project's overall impact.

Each stakeholder group's involvement, whether through direct participation in activities or by providing necessary support and resources, was instrumental in linking the inputs and outputs to the project's social outcomes.

CHAPTER 5: STAGE 3 - EVIDENCING OUTCOMES AND GIVING THEM A VALUE

In this chapter, we'll explain how we developed outcome measurements and collected data on the changes. We'll also discuss how we derived financial proxies for these outcomes.

5.1 Developing Outcome Measurements

Outcome measurement is a critical component in understanding and quantifying the changes brought about by a project. Various types of measurements can be employed to capture these changes, including indicators, scales, or combinations of different measurement types. Effective outcome measurement involves using appropriate methods that reflect the nature of the outcomes and the context of the project.

Indicators are specific, quantifiable measures that provide evidence of change. They are often used to track progress and assess the extent to which outcomes have been achieved. Indicators can be numerical, such as the number of trees planted or the percentage increase in physical activity among community members. These quantitative measures provide clear, objective data points that can be easily tracked and analyzed over time.

Scales are tools used to measure the intensity or degree of a particular outcome. They can capture subjective changes, such as improvements in well-being or satisfaction. For instance, a Likert scale might be used to measure residents' perceptions of environmental quality before and after the reforestation project. Scales allow for the assessment of more nuanced, qualitative changes that might not be easily quantified through simple counts or percentages.

For the Wanli Coastal Reforestation Project, various outcomes were identified that required precise measurement. Objective indicators were developed to measure specific changes such as the frequency of exercise per week, the amount of time spent on house cleaning, and the number of media exposures. These objective measurements allowed for a clear and quantifiable assessment of these changes, providing concrete evidence of the project's impact. Additionally, subjective outcomes, which are inherently more difficult to measure, were addressed by referencing established research papers to derive appropriate sets of measurements. The selected questions were designed to align closely with the feedback obtained from the initial qualitative interviews, ensuring relevance and accuracy in capturing stakeholders' experiences and perceptions.

By integrating both objective indicators and subjective scales, the outcome measurement strategy for the Wanli Project offers a comprehensive view of the project's impact. This balanced approach not only provides quantitative data that can be easily analyzed but also captures the qualitative nuances of stakeholders' experiences, offering a richer, more detailed understanding of the project's outcomes.

The outcome measurements for all well-defined outcomes are detailed in **Appendix B**. For instance, to assess "Environmental Comfort," references such as Roskams and Haynes (2021) and Cicerali et al. (2017) were employed, using scales ranging from 1 (very dissatisfied) to 5 (very satisfied) to measure aspects like visual comfort, air quality, hygiene, and smell. For "Increased Level of Physical Activity," the study used Tseng (2011) as a reference, with scales measuring exercise frequency and duration before and after reforestation. The "Increased Sense of Safety" outcome was assessed using Pérez-Tejera et al. (2022) with a scale from 1 (not at all safe) to 5 (very safe), measuring residents' perceptions of safety in their neighborhood. These examples demonstrate the structured approach taken to measure outcomes, ensuring both objective and subjective changes were accurately captured and quantified.

5.2 Collecting Outcomes Data

With outcome measurements confirmed, we then developed questionnaires for respective stakeholder groups and sub-groups accordingly, and then conducted quantitative survey to evidence the outcomes, assess the magnitude of impact, and examine materiality. Additionally, we collected data on outcome importance and other influencing factors, including counterfactual, attribution, displacement, drop-off, and duration. Before rolling out the survey, we discussed the draft questionnaire with TOAF Afforestation team members to ensure evaluation criteria were correctly used. The survey findings will be detailed in Chapter 6.

Table 14 provides an overview of the data collection process for the SROI analysis of the Wanli Project. It outlines the various stakeholder categories and sub-groups, their respective populations, and the number of data points collected from each group.

Among the Community Residents, we employed a random door-to-door sampling technique to ensure that individual within the community had an equal chance of being selected. This approach minimizes selection bias and enhances the representativeness of the sample. Participation, of course, was subject to the willingness of the residents we visited. We used the 2017 Wanli District Office Statistical Yearbook to estimate the population of Dapeng Village, which helped us determine the target number of completed questionnaires. Data was then collected from 61 out of 572 individuals, achieving a response ratio of approximately 10.7%. This substantial sample size from the community residents provides a solid foundation for understanding the project's impact on this group.

For Educational Participants 1. College Students and 2. Lamrim course attendees, due to the geographically dispersed nature of the group, we adopted online survey by sending out survey links to all members within the groups. To encourage their responses, we offered a gift voucher. Among college students, 19 out of 160 participated, resulting in a response ratio of 11.9%. The Lamrim course attendees had a higher participation rate, with 12 out of 40 individuals responding, achieving a 30% response ratio.

In the case of Hotai Motor, TOAF, Zen Zhou Co. and the Rotary Club (District 3481), each being an

organization, data was collected from a representative sample within each organization, ensuring that the perspectives of key individuals responsible for decision-making and project implementation were captured. Afforestation Team Members also showed a high level of engagement, with 3 out of 5 members providing data, resulting in a 60% response ratio.

Overall, data was collected from 99 out of a total population of 781, resulting in an overall response ratio of approximately 12.7%. This comprehensive data collection ensures that the analysis captures a wide range of perspectives from different stakeholder groups, providing a robust basis for understanding the project's impact.

Table 14. Population and Data Collected from Stakeholder Groups in the SROI Analysis

Stakeholder Category	Sub-group	Population	Data Collected
Community Residents	-	572	61
Educational Participants	College students	160	19
	Lamrim course attendees	40	12
	Rotary Club, District 3481 (Org.)	1	1
Hotai Motor (Org.)	-	1	1
Project Executors	TOAF (Org.)	1	1
	Zen Zhou Co. (Org.)	1	1
	Afforestation Team Members	5	3
		781	99

We assessed outcomes and their corresponding changes using data collected from the quantitative survey, with the measurements detailed in **Appendix B**. The research papers referenced for outcome measurements are listed in the Reference section, items 11-41. The extrapolation of the sample was conducted using a proportional method. For example, if a survey of 29 community residents (a representative sample) found that 80% reported experiencing improved environmental comfort, this percentage was then applied to the total population of community residents involved in the project. This approach assumes that the sample's experiences are representative of the broader group's experiences.

5.3 Examining Materiality

When defining well-defined outcomes, one of the key principles integrated into SROI is materiality, which is an accounting concept applied within this framework. Materiality involves assessing whether the omission or misrepresentation of an outcome could have an impact on the decisions, actions, or performance of an organization or its stakeholders. Meanwhile, it's important to note that an

organization cannot feasibly include every individual stakeholder's outcome. Instead, it must prioritize resource allocation to maximize its impact. As a result, some outcomes may only be relevant to a few individuals and, when considered in the overall context of the activity, may be considered immaterial. Similarly, there may be outcomes that are relevant but not deemed significant due to their low quantified impact. Principle 4: Only Include What Is Material was applied to establish the boundaries of what information and evidence must be included in an account of value. This ensures a true and fair representation based on stakeholder evidence, focusing decisions on the changes that matter most.

Materiality is determined by considering two key factors: the relevance and significance of an outcome. The examination of materiality involves a two-step process:

Step 1: Relevance

This assessment is conducted during the qualitative engagement process. For example:

- In the Community Residents stakeholder group, the outcome 'Has a sense of achievement' was mentioned by the community temple's chief administrator. This is due to his active involvement in securing government support for afforestation in the community. While his accomplishments are meaningful for the community overall, it's not perceived as relevant from the broader perspective of community residents. Therefore, we excluded it from the outcomes.
- In the College Students sub-group, the outcome 'Feeling fatigue' was mentioned by two students. This feeling is resulted from participating in the activity on that day and is temporary. Therefore, we excluded it from consideration.

Step 2. Significance

To evaluate significance, we examine the percentage of people who reported experiencing the change and the weighting assigned to each outcome. We set the threshold at 5%. If an outcome has less than 5% of people reporting experiencing it, we deemed it as low significance and exclude it from further consideration. Meanwhile, the average difference between baseline and post-intervention scores for each respondent was calculated to determine the average depth of change, providing a clear measure of how much change occurred. Additionally, the average distance traveled, which is often expressed as a percentage of the maximum possible change, was used to quantify the extent of progress made towards achieving the desired outcomes. Table 15 is the significance check summary of well-defined outcomes with the Percentage of People Experiencing Change (% of Ppl Exp. Change), Average Depth of Change, and Average Distance Traveled for Stakeholder Groups.

For Community Residents, outcomes like improved environmental comfort (90%), increased physical activity (28%), and improved respiratory health (34%) were notable, with an average depth of change of 1.40, 3.37 days per week, and 1.50, respectively. Similarly, outcomes such as increased sense of safety and aroused environmental behavior intentions were also significant. However, outcomes like "Feeling unsafe" were excluded due to low significance (1%).

College Students reported outcomes such as increased willingness to engage in pro-environmental behaviors (53%) and took part in other environment-related activities (32%), with respective average depth of change and distance traveled metrics indicating substantial impact. The outcome "Feeling powerless" was excluded for this group due to its low significance (5%).

Other stakeholder groups, including Lamrim Course Attendees, Rotary Club (District 3481), Hotai Motor, TOAF, and Zen Zhou Co., also showed significant outcomes. For instance, Lamrim Course Attendees had 67% reporting taking pro-environment actions with an average depth of change of 1.23. Hotai Motor showed facilitated corporate's pro-environmental practices (100%), enhanced corporate reputation (100%), and other positive outcomes.

Afforestation Team Members experienced outcomes such as improved communication skills (67%) and enhanced social contribution (67%). However, outcomes like "Improved stamina" and "Feeling powerlessness" were excluded due to insignificance. After the significance check, we excluded the following outcomes from the subsequent SROI analysis: Feeling Unsafe (Community Residents), Feeling Powerless (College Students), and Improved Stamina and Feeling Powerless (Afforestation Team Members).

Table 15. Significance Check of Well-Defined Outcomes

Stakeholder	Well-Defined Outcomes	% of Ppl Exp. Change	Average Depth	Average Distance Traveled
Community Residents	Improved environmental comfort	90%	1.40	0.35
	Increased physical activity	28%	3.37 days 36.11 mins	NA
	Improved respiratory health	34%	1.50	0.38
	Reduced frequency and time spent on cleaning house	45%	-1.46 days -0.46 days	0.37
	Increased sense of safety	34%	1.28	0.32
	Aroused environmental behavior intentions	21%	1.60	0.40
	Took environmental protection actions	10%	1.54	0.39
	Increased a sense of commitment for the community	17%	1.52	0.32
	Advocated pro-environmental behavior or tree-planting	34%	1.87	0.47
	Feeling unsafe [Excluded]	3%	-0.80	-0.20
College Students	Purchased environmentally friendly products	21%	1.21	0.30
	Took part in other environment related activities	32%	0.28	0.07
	Enhanced empathy to natural environment	63%	0.61	0.15
	Increased willingness in pro-environmental behaviors	53%	0.68	0.17
	Took pro-environment actions	37%	0.53	0.13
	Advocated pro-environmental behavior or tree-planting	53%	0.60	0.15
	Feeling powerless [Excluded]	5%	0.67	0.17
	Took pro-environment actions	67%	1.23	0.31
	Took part in other environment related activities	50%	0.80	0.20

Lamrim Course Attendees	Encouraged family members or friends to take pro-environment actions	67%	0.59	0.15
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	100%	1.00	0.25
	Facilitated and expanded scope of networking for organization	100%	0.67	0.17
Hotai Motor	Facilitated corporate's pro-environmental practices	100%	1.00	0.25
	Enhanced corporate reputation	100%	1.25	0.31
	Enhanced employee engagement	100%	1.00	0.25
	Enhanced dealer engagement	100%	1.20	0.30
TOAF	Enhanced team's competencies and effectiveness	100%	1.80	0.45
	Enhanced team resilience	100%	1.33	0.33
	Gained organization resources	100%		
	TV news report		5	NA
	Print magazine exposures		19	NA
	Internet news coverage		53	NA
	Social media		300 FB fans	NA
	Gained government and academic partnerships	100%		
	Government		1	NA
	Academic		1	NA
Zen Zhou Co.	Enhanced team's core competencies	100%	0.50	0.13
	Gained organization resources	100%		
	TV news report		1	NA
	Print magazine exposures		2	NA
	Internet news coverage		3	NA
	Social media		500 FB fans 50 IG fans	NA
Afforestation Team Members	Had a sense of self-worth	67%	1.00	0.25
	Improved communication skills	67%	1.29	0.32
	Improved stamina [Excluded]	0%	-	-
	Enhanced social contribution	67%	0.75	0.19
	Increased pro-environment commitment	67%	0.90	0.23
	Enhanced a sense of achievement	100%	1.11	0.28
	Deteriorated physical conditions	33%	0.67	0.17
	Feeling powerless [Excluded]	0%	-	-

5.4 Establishing How Long Outcomes Last

Duration refers to the length of time each outcome will persist. The duration directly impacts the assessment of future value and can vary depending on the nature of the changes and the specific stakeholder groups involved. The duration of each well-defined outcome is determined by directly asking stakeholders how long they experienced the outcomes as post to the activity. This approach leverages the firsthand insights of those who directly experienced the outcomes, providing realistic and accurate estimates. This information was collected through quantitative surveys, where participants were asked to reflect on and estimate the length of time the changes lasted for them.

The responses were then averaged to calculate the overall duration for each outcome. Additionally, we checked the standard deviation of the duration estimates to ensure that the average values accurately represented the stakeholder experiences and were suitable for analysis. By collecting these personal accounts, we can more accurately gauge the sustainability and long-term impact of the project's outcomes.

In the Wanli Project, many of the outcomes have shown lasting impacts with a reasonably strong level of credibility. This is particularly evident for the Community residents. The reasons for this sustained impact are summarized as follows:

- The ongoing growth of the trees has led to enduring changes within the community residents, as indicated by the Community Residents stakeholder group. As long as the trees continue to thrive, their positive effects on the community residents are perceived to persist.
- The tree-planting activity encompasses on-site education, sapling-planting, and beach cleanup. Together, these components raised awareness on the participants to reevaluate their daily behaviors in relation to the environment. The striking scene of beach litter, in particular, prompted stakeholders to reflect on their actions and subsequently make lasting behavioral changes as we were told by the stakeholders.

While many stakeholders expressed a belief in the enduring nature of most outcomes, to avoid over-claiming, we adjusted the estimated duration to six years for those who initially suggested 'indefinitely'. The outcome starts in the period after. Table 16 outlines the well-defined outcomes and their respective durations for various stakeholder groups involved in the Wanli Project.

Table 16. Well-Defined Outcomes and Their Duration for Various Stakeholder Groups

Stakeholder	Well-Defined Outcomes	Duration
Community Residents	Improved environmental comfort	6
	Increased physical activity	6
	Improved respiratory health	6
	Reduced frequency and time spent on cleaning house	5
	Increased sense of safety	5
	Aroused environmental behavior intentions	5
	Took environmental protection actions	6
	Increased a sense of commitment for the community	6
	Advocated pro-environmental behavior or tree-planting	4
College Students	Purchased environmentally friendly products	5
	Took part in other environment related activities	5
	Enhanced empathy to natural environment	4
	Increased willingness in pro-environmental behaviors	4
	Took pro-environment actions	4
	Advocated pro-environmental behavior or tree-planting	3
	Took pro-environment actions	5

Lamrim Course Attendees	Took part in other environment related activities	5
	Encouraged family members or friends to take pro-environment actions	5
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	6
	Facilitated and expanded scope of networking for organization	6
Hotai Motor	Facilitated corporate's pro-environmental practices	5
	Enhanced corporate reputation	5
	Enhanced employee engagement	5
	Enhanced dealer engagement	2
TOAF	Enhanced team's competencies and effectiveness	6
	Enhanced team resilience	6
	Gained organization resources	6
	Gained government and academic partnerships	3
Zen Zhou Co.	Enhanced team's core competencies	5
	Gained organization resources	3
Afforestation Team Members	Had a sense of self-worth	4
	Improved communication skills	5
	Enhanced social contribution	5
	Increased pro-environment commitment	5
	Enhanced a sense of achievement	4
	Deteriorated physical conditions	2

5.5 Valuing Outcomes

Principle 3: Value the Things That Matter emphasizes the importance of recognizing the relative value or worth of different changes or outcomes that people experience as a result of activities. Given that value is inherently subjective, it is essential to apply this principle in conjunction with Principle 1: Involve Stakeholders, ensuring outcomes are valued from the stakeholders' perspectives. In SROI, financial proxies estimate the social value of non-traded goods for various stakeholders. Just as individuals may disagree on the value of a traded good, different stakeholders will have varying perceptions of the value they derive from different outcomes. By estimating this value through financial proxies and combining these valuations, we can estimate the total social value created by an intervention. Sometimes, monetization can be straightforward, particularly when it relates to cost savings. For example, to value improved health from the government's perspective, one might use the cost of attending a doctor's clinic as a proxy. By sourcing such proxies, we can effectively measure and convey the social value of outcomes in financial terms.

Table 17 outlines the valuation methods used for different stakeholder groups involved in the Wanli Coastal Reforestation Project. For non-monetary valuation, Bounded Weighting was applied across all stakeholder categories, including Community Residents, Educational Participants, Hotai Motor, and Project Executors. This method was chosen to reflect stakeholders' perceptions of value within a structured range, allowing for the capture of subjective assessments without converting them directly into monetary terms.

For monetary valuation, two distinct methods were employed: the Stated Preference method and the Cost-Based method. The Stated Preference approach was used for Community Residents, College Students, Lamrim Course Attendees, and Afforestation Team Members. This method involves directly asking stakeholders how much they would be willing to pay for a positive outcome or service, capturing their subjective valuation of the benefits received. It was particularly suitable for these groups, as it provided a straightforward way to assess how they value specific project outcomes. For instance, the Stated Preference method allowed us to determine the monetary value that community residents placed on improved environmental comfort or increased physical activity, reflecting their personal willingness to pay for these benefits.

During the analysis, we initially considered using the Value Game approach for individual stakeholders, which involves stakeholders ranking or selecting from a range of outcomes or goods to infer their implicit valuations. However, this method was found to be unsuitable, particularly for community residents, due to its complexity and the difficulty many elderly participants faced in understanding and engaging with a game-like format. Given these challenges, we opted for a more accessible and straightforward approach, choosing the Stated Preference method, which allowed for clear and comprehensible valuation of outcomes. After assessing the limitations and ensuring the need for consistency, we decided to apply a uniform valuation approach across all individual stakeholder groups. This decision was made to maintain comparability and coherence in the analysis, ensuring that the valuation of outcomes was consistent and aligned with stakeholders' capacity to understand and participate meaningfully in the valuation process.

On the other hand, the Cost-Based method was used for organizational stakeholders, such as Rotary Club, District 3481, Hotai Motor, TOAF, and Zen Zhou Co. This approach estimates value based on the actual costs incurred or avoided by these organizations as a result of the project. The rationale behind using the Cost-Based method for these stakeholders is that it provides a more objective measure of value, grounded in real financial data, which is more relevant to organizations than subjective perceptions.

Table 17. Valuation Methods for Stakeholder Groups

Stakeholder Category	Sub-group	Non-Monetary Valuation	Monetary Valuation
Community Residents	-	Bounded Weighting	Stated Preference
Educational Participants	College students	Bounded Weighting	Stated Preference
	Lamrim course attendees	Bounded Weighting	Stated Preference
	Rotary Club, District 3481 (Org.)	Bounded Weighting	Cost-Based
Hotai Motor	-	Bounded Weighting	Cost-Based
Project Executors	TOAF (Org.)	Bounded Weighting	Cost-Based
	Zen Zhou Co. (Org.)	Bounded Weighting	Cost-Based
	Afforestation Team Members	Bounded Weighting	Stated Preference

To maintain consistency and accuracy in the valuation process, the financial proxies were selected to reflect the same time frame as the outcomes. For example, if an outcome was determined to have a duration of one year, the financial proxy used to value that outcome was also based on an annual valuation. This approach ensures that the economic value assigned to each outcome accurately represents the period over which stakeholders benefit from it, preventing any overestimation or underestimation of value. In cases where outcomes were expected to last multiple years, we adjusted the financial proxies to match the multi-year duration. We applied discounting methods to account for the time value of money, ensuring that the valuation reflects the present value of future benefits. This method aligns the financial proxies with the duration of the outcomes, providing a more precise and credible assessment of the project's impact.

Sections 5.5.1 and 5.5.2 provide a detailed explanation of how these valuation methods were chosen and the specific outcomes associated with each stakeholder group. Through the careful selection and application of these methods, we aimed to capture both the subjective perceptions and objective measurements of value, ensuring a comprehensive and balanced assessment of the project's impact on diverse stakeholders. This approach allows us to accurately reflect the varied experiences and contributions of all groups involved, providing a holistic view of the project's overall value and effectiveness.

5.5.1 Non-monetary valuation

We utilized Bounded Weighting (1-10) for non-monetary valuation to effectively measure the importance of different outcomes as perceived by stakeholders. While non-monetary valuation approaches like weighting do not represent value in monetary terms and are not suitable for SROI calculations, they can provide valuable validation to monetary valuations or complement them. Bounded Weighting was chosen for its structured approach, allowing stakeholders to rate each outcome on a scale from one to ten, where ten is the most important. By asking stakeholders to rate the importance of each outcome, Bounded Weighting helps articulate the perceived value of changes in a straightforward and accessible manner. This method aligns with the project's goal of understanding and evaluating the significance of various outcomes from the stakeholders' perspectives, providing a more nuanced view of the project's impact.

Table 18 presents the results of the importance rating of well-defined outcomes for various stakeholder groups that are individuals in the Wanli Project. For Community Residents, outcomes such as increased physical activity (10), improved environmental comfort (9), and improved respiratory health (9) were rated highly. College Students placed significant importance on increased willingness to engage in pro-environmental behaviors (7) and enhanced empathy to the natural environment (7). This importance rating helps to quantify the relative significance of each outcome from the stakeholders' perspectives.

Table 18. Importance Ratings of Well-Defined Outcomes for Individual Stakeholder Groups

Stakeholder	Well-Defined Outcomes	Importance
Community Residents	Improved environmental comfort	9
	Increased physical activity	10
	Improved respiratory health	9
	Reduced frequency and time spent on cleaning house	7
	Increased sense of safety	8
	Aroused environmental behavior intentions	5
	Took environmental protection actions	6
	Increased a sense of commitment for the community	6
College Students	Advocated pro-environmental behavior or tree-planting	4
	Purchased environmentally friendly products	8
	Took part in other environment related activities	6
	Enhanced empathy to natural environment	7
	Increased willingness in pro-environmental behaviors	7
Lamrim Course Attendees	Took pro-environment actions	9
	Took part in other environment related activities	8
	Encouraged family members or friends to take pro-environment actions	7
Afforestation Team Members	Took pro-environment actions	9
	Had a sense of self-worth	10
	Improved communication skills	8
	Enhanced social contribution	9
	Increased pro-environment commitment	7
	Enhanced a sense of achievement	8
	Deteriorated physical conditions	2

Meanwhile, Table 19 presents the results of the importance ratings for well-defined outcomes among stakeholder groups that are organizations involved in the Wanli Project. For example, outcomes such as "Facilitated corporate's pro-environmental practices" and "Enhanced corporate reputation" for Hotai Motor received high importance ratings of 9, indicating their significant value to the organization. Similarly, "Enhanced team's competencies and effectiveness" received a top rating of 10 for TOAF, emphasizing its critical importance. On the other hand, outcomes with lower importance ratings, such as "Encouraged organization to engage in corporate social responsibility actions" with a rating of 6 for Rotary Club, District 3481, indicate a relatively lesser priority. These ratings provide insight into the relative importance of various outcomes from the perspective of the involved organizations, helping to prioritize efforts and resources in the SROI analysis.

Table 19. Importance Ratings of Well-Defined Outcomes for Organizational Stakeholder Groups

Stakeholder	Well-Defined Outcomes	Importance
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	6
	Facilitated corporate's pro-environmental practices	7
Hotai Motor	Facilitated corporate's pro-environmental practices	9
	Enhanced corporate reputation	9
	Enhanced employee engagement	8
	Enhanced dealer engagement	7
TOAF	Enhanced team's competencies and effectiveness	10
	Enhanced team resilience	9
	Gained organization resources:	9
	Gained government and academic partnerships:	9
Zen Zhou Co.	Enhanced team's core competencies	9
	Gained organization resources	5

5.5.2 Monetary valuation

Stated Preference approach which involves directly asking individuals about their preferences through surveys or experiments. This method collects data on hypothetical scenarios to infer values, often used when market behavior data is unavailable. We applied the contingent valuation²⁵ method to ask respondents directly how much they are willing to pay for a positive good or service. This approach was chosen because it is straightforward and relatively easy for stakeholders, particularly community residents, to understand and engage with. Given the demographic profile of the community residents—many of whom are elderly—the contingent valuation method was more accessible and produced more reliable data compared to alternative methods.

Table 20 shows the average financial proxy for each well-defined outcome for the individual stakeholder groups using the contingent valuation approach. For instance, improved environmental comfort for Community Residents is valued at NTD 36,967, while increased physical activity is valued at NTD 46,475. Similarly, improved communication skills for Afforestation Team Members is valued at NTD 32,000, and enhanced social contribution is valued at NTD 44,000. These financial proxies help quantify the social value of well-defined outcomes, providing a comprehensive monetary assessment of the project's impact.

The stakeholders provided of the changes was considered reasonable because for some of the outcomes, there are existing goods or services in the market that could potentially deliver similar changes. By referencing these counterparts, we were able to gauge the reasonableness of the estimation. For example, for the outcome of 'Improved respiratory health', there's standard co-pay fee regulated by National Health Insurance for clinic visit. For the outcome of "Increased physical

²⁵ Johannesson, M. (1996). The Contingent Valuation Controversy in Environmental Economics and its Relevance to Health Services Research. *Journal of Health Services Research & Policy*, 1(2), 116-117.

activity”, there’re many elderly fitness courses in the market where we can gauge the reasonability of the financial estimation.

Table 20. Financial Proxies for Well-Defined Outcomes in Individual Stakeholder Groups

Stakeholder	Well-Defined Outcomes	Financial Proxy (NTD)
Community Residents	Improved environmental comfort	36,967
	Increased physical activity	46,475
	Improved respiratory health	15,600
	Reduced frequency and time spent on cleaning house	12,337
	Increased sense of safety	16,500
	Aroused environmental behavior intentions	3,700
	Took environmental protection actions	14,163
	Increased a sense of commitment for the community	10,000
	Advocated pro-environmental behavior or tree-planting	3,000
College Students	Purchased environmentally friendly products	7,200
	Took part in other environment related activities	2,000
	Enhanced empathy to natural environment	3,500
	Increased willingness in pro-environmental behaviors	3,720
	Took pro-environment actions	10,000
Lamrim Course Attendees	Advocated pro-environmental behavior or tree-planting	2,000
	Took pro-environment actions	12,000
	Took part in other environment related activities	9,000
Afforestation Team Members	Encouraged family members or friends to take pro-environment actions	7,200
	Had a sense of self-worth	54,000
	Improved communication skills	32,000
	Enhanced social contribution	44,000
	Increased pro-environment commitment	24,000
	Enhanced a sense of achievement	37,000
	Deteriorated physical conditions	-4,767

Meanwhile, for the organizational stakeholders, a cost-based approach was adopted to value the corresponding well-defined outcomes. This approach was chosen because the cost-based valuation method offers a more objective and consistent assessment compared to other methods, particularly when organizations later integrate the impact management system into their operations. As a result, it is considered more suitable for valuing organizational changes. The Cost-Based Approach, including methods like the Replacement Cost Method, Damage Cost Avoided, and Opportunity Cost, focuses on estimating the monetary value of an outcome based on the costs associated with achieving, replacing, or avoiding that outcome. This approach is often used in organizational and societal contexts where direct market valuations are challenging. Specifically, it estimates the monetary value of an outcome based on the costs associated with achieving that outcome, such as the cost of a training course or educational program that leads to the desired result. Table 21 shows the financial proxy and the reference source of the costs related to the inputs required to produce the outcome. For example, proxies for TOAF include costs for TV news reports, print magazine exposures, internet news coverage, social media, and extra funding. These financial proxies provide a monetary

estimation of the value generated by the Wanli Project's interventions for these organizational stakeholders.

In terms of judging the reasonableness of the financial costs referenced, we adopted government-based or generally recognized values for goods and services whenever applies. For instance, for Hotai Motor's "Facilitated corporate pro-environmental practices" outcome, we referred to the subsidy provided by the Ministry of Economic Affairs to small and medium enterprises to support ESG transformation. For its "Enhanced corporate reputation" outcome, we calculated media value based on the incremental number of free media exposures Hotai Motor acquired during the first year of the initiative. Publicized information on media values, such as the cost of a 30-second TV news report or the production cost of a one-page magazine report, was used.

We also referred to information publicized from organizations' own website. For Hotai Motor's "Enhanced employee engagement," we referred to its 2017 Q4 financial statement to calculate the employee time cost for participating in the tree-planting activity. The same logic and rationale were applied to all organization-based outcomes. Details of the rationale and source for each organizational outcome are summarized in Table 21.

Table 21. Financial Proxies for Well-Defined Outcomes in Organizational Stakeholder Groups

Stakeholder	Well-Defined Outcomes	Financial Proxy (NTD)	Rationale	Source
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	300,000	Smart Carbon Reduction Subsidy for Business Service Industry', provided by Ministry of Economic Affairs	https://go.commeet.co/blog/%E4%BC%81%E6%A5%AD%E8%B2%AC%E4%BB%BB/esg-subsidy/
	Facilitated and expanded scope of networking for organization	750,000	2023 District Joint Christmas Party' expenses	https://taiwan-rotary.org/article/detail.php?id=35
	Facilitated corporate's pro-environmental practices	5,500,000	Government Subsidy for ESG Transformation of Small and Medium Enterprises: Smart Manufacturing Innovative Value-Added Application Guidance Program Type A	https://www.tsmedcpa.org/latest_events/49
Hotai Motor	Enhanced corporate reputation	4,148,750	Estimated media value of gained through the sponsorship	General website information
	Enhanced employee engagement	3,873,544	Paid leave for employees participating in a half-day volunteer activity	https://pressroom.hotaimotor.com.tw/lib/f/201804181617-01.pdf
	Enhanced dealer engagement	1,295,449	Dealers' one-month employee training cost	https://pressroom.hotaimotor.com.tw/csr/article/Yul2ejVKe

	Enhanced team's competencies and effectiveness	81,000	Cost of two 2 similar activities: (1) 'Corporate Sustainable Manager and Certification' course (2) Arborist training and certification	https://elearning.taise.org.tw/taise/#/course/detail/1000030 https://www.facebook.com/toaf.planttree/posts/545680308948900/?locale=zh_TW
	Enhanced team resilience	31,200	Rock climbing training	https://kirinclimbing.com.tw/h/ServiceDetail?key=fum3t&set=7&cont=279788
	Gained organization resources:		Estimated media value	General website information
TOAF	(1) TV news report	890,000	Cost for 5 extra 60-90 sec. news report	
	(2) Print magazine exposures	1,767,000	Cost for 19 extra print news report on magazines and newspapers	
	(3) Internet news coverage	457,125	Cost for 53 extra internet news exposure on major news sites	
	(4) Social media	10,500	Cost for 300 extra Facebook fans	
	(5) Extra funding	2,090,000	Factual data from TOAF	
	Gained government and academic partnerships:			
	(1) Government	100,000	Government Conference Sponsorship fee	
	(2) Academic	50,000	'Society for Environmental Education in Taiwan' permanent member fee	https://www.csee.org.tw/portal_a1.php?owner_num=a1_612961&button_num=a1
	Enhanced team's core competencies	1,050,000	Taiwan Social Innovation for Sustainable Development Association	https://www.accupass.com/event/230914114209105001553
	Gained organization resources:		Estimated media value	General website information
Zen Zhou Co.	(1) TV news report	178,000	Cost for 1 extra 60-90 sec. news report	
	(2) Print magazine exposures	186,000	Cost for 2 extra print news report on magazines and newspapers	
	(3) Internet news coverage	25,875	Cost for 3 extra internet news exposure on major news sites	
	(4) Social media	19,250	Cost for 500 extra Facebook fans, and 50 extra Instagram fans	

CHAPTER 6: STAGE 4 - ESTABLISHING IMPACT

In this chapter, we will address the principle in SROI of not over-claiming project impact. It is necessary to consider what other external factors that may have influenced or affected the changes that stakeholders experienced. There are four impact factors to be considered:

- What would have happened anyway (counterfactual)?
- Have the activities displaced value from elsewhere (displacement)?
- What is the contribution of others (attribution)?
- If an outcome is projected to last more than 1 year, what is the rate at which value created by a project reduces over future years (drop-off)?

Evaluating counterfactuals, displacement, attribution, and drop-off is crucial for establishing impact in (SROI) analysis, aligning with Social Value Principle 5: "Do not overclaim." Together, these evaluations ensure that the SROI analysis accurately reflects the true impact of the intervention, preventing overestimation and supporting responsible and transparent reporting of social value²⁶.

Data on counterfactual, displacement, attribution, and drop-off were collected through the stakeholder consultation approach conducted during the quantitative study stage. The survey was designed to capture both quantitative and qualitative data from a representative sample of stakeholders. The method of Involvement is listed as follows.

1. **Survey Design and Distribution:** The survey included specific questions that asked respondents to estimate the levels of each factor (attribution, drop-off, counterfactual, and displacement) based on their experiences and observations. For example, respondents were asked to provide their perception of the extent to which the outcomes achieved could be attributed to the project versus other external factors (attribution). Similarly, questions regarding counterfactual asked respondents to estimate the likelihood that these outcomes would have occurred without the intervention.
2. **Open-Ended Questions for Rationale:** To complement the quantitative estimates, the survey included open-ended questions that allowed respondents to explain the rationale behind their answers. This approach provided deeper insights into the reasoning behind the stakeholders' assessments and helped identify any factors influencing their responses. These qualitative responses were reviewed to determine the reasonableness and validity of the estimations provided.

²⁶ Cordes, J. (2017). Using cost-benefit analysis and social return on investment to evaluate the impact of social enterprise: Promises, implementation, and limitations. *Evaluation and Program Planning*, 64, 98-104.

3. Data Collection Process: The survey was distributed to stakeholders using the approach described on pages 46 and 47.
4. Analysis and Validation: The data collected from the survey were analyzed to establish the average levels of attribution, drop-off, deadweight, and displacement. The open-ended responses were thematically analyzed to validate and contextualize the quantitative findings, ensuring that the levels established accurately reflect the stakeholders' experiences and perceptions.

6.1 Counterfactual

Counterfactual is a measure of the amount of outcome that would have happened even if the activity had not taken place²⁷. For example, there is often the chance the people could have experienced the same changes by working with another organization, or even without the support from anyone. In quantitative survey stakeholders were being asked to rank on a 5-point scale how likely they think that the change would happen had they not attended the activity. The results were then calculated as a percentage out of a factor of 100. We then averaged all numbers calculated to derive counterfactual ratio for each change.

Table 22 summarizes the counterfactual estimates for well-defined outcomes for all stakeholders. The Community Residents stakeholder group reported the lowest counterfactual scores, with most outcomes scoring below 22%. This is understandable because only the reforested trees brought specific changes, such as improving environmental comfort and reducing airborne sand. The relatively higher scores were observed for 'Increased physical activity' at 35% and 'Took environmental protection actions' at 27%. Regarding the outcome of 'Increased physical activity,' we learned that some community residents have developed a habit of exercising along the coastline since their younger days, regardless of whether trees were present or not. Additionally, one individual mentioned a preference for hiking in nearby mountain areas. Consequently, the coastline reforestation did not appear to have a strong impact on these community residents. Regarding the outcome of 'Took environmental protection actions,' residents mentioned that other beach cleaning activities organized by different organizations also took place in the area, which motivated them to take actions to protect their living environment.

For all other stakeholder groups, the reported counterfactual scores are mostly higher than 30%. For example, in the case of Educational Participants stakeholder sub-groups, the counterfactual scores range between 40% to 60%. Upon closer examination of these outcomes, which primarily pertain to the enhancement of environmental awareness, actions, and commitment, respondents perceived that various factors would contribute to these changes. These factors include global trends, news, social media, government and non-profit organization-led education initiatives.

²⁷ Social Value International (2023). SVI Glossary 2.0.

For TOAF Afforestation team members, they are individuals who recognized TOAF's vision and values and subsequently became employees. Therefore, without the Wanli Project, they believe there'd be other pro-environment projects that contribute to the formation of outcomes experienced. Consequently, the counterfactual scores assigned are also relatively high, ranging from approximately 40% to 60%.

Table 22. Counterfactual Estimates for Well-Defined Outcomes

Stakeholder	Well-Defined Outcomes	Counterfactual (%)
Community Residents	Improved environmental comfort	11%
	Increased physical activity	35%
	Improved respiratory health	16%
	Reduced frequency and time spent on cleaning house	11%
	Increased sense of safety	10%
	Aroused environmental behavior intentions	14%
	Took environmental protection actions	27%
	Increased a sense of commitment for the community	22%
	Advocated pro-environmental behavior or tree-planting	17%
College Students	Purchased environmentally friendly products	50%
	Took part in other environment related activities	42%
	Enhanced empathy to natural environment	54%
	Increased willingness in pro-environmental behaviors	42%
	Took pro-environment actions	41%
	Advocated pro-environmental behavior or tree-planting	29%
Lamrim Course Attendees	Took pro-environment actions	40%
	Took part in other environment related activities	60%
	Encouraged family members or friends to take pro-environment actions	51%
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	30%
	Facilitated and expanded scope of networking for organization	30%
Hotai Motor	Facilitated corporate's pro-environmental practices	30%
	Enhanced corporate reputation	50%
	Enhanced employee engagement	50%
	Enhanced dealer engagement	50%
TOAF	Enhanced team's competencies and effectiveness	50%
	Enhanced team resilience	50%
	Gained organization resources	20%
	Gained government and academic partnerships	20%
Zen Zhou Co.	Enhanced team's core competencies	70%
	Gained organization resources	60%
Afforestation Team Members	Had a sense of self-worth	60%
	Improved communication skills	40%
	Enhanced social contribution	40%
	Increased pro-environment commitment	60%
	Enhanced a sense of achievement	60%
	Deteriorated physical conditions	10%

6.2 Displacement

In this SROI analysis, the stakeholder consultation approach was adopted to measure displacement. During the quantitative survey, stakeholders were asked to evaluate whether the outcomes they experienced might have caused a reduction in outcomes for other stakeholder groups. For those who believed such an impact was likely, they were asked to estimate the extent of this decrease as a percentage, ranging from 0% (indicating no displacement) to 100% (indicating complete displacement of other outcomes). These estimates were then averaged to calculate the displacement ratio for each outcome. Additionally, stakeholders were invited to qualitatively describe how they perceived the displacement effect and to provide their rationale for the quantitative estimates they provided. This approach allowed for a comprehensive understanding of both the quantitative extent of displacement and the contextual factors influencing these perceptions. Table 23 summarizes the displacement estimates for well-defined outcomes. Displacement is a percentage that signifies the extent to which the recorded outcomes have replaced or displaced other existing outcomes, implying that the achievement of our project's outcomes came at the cost of other outcomes. Across all stakeholder groups and sub-groups, the majority of the outcomes show no reported displacement. Exception being that one Lamrim Course Attendee believed that her overemphasis on pro-environmental ideas or actions caused unintended adverse effect.

Table 23. Displacement Estimates for Well-Defined Outcomes

Stakeholder	Well-Defined Outcomes	Displacement (%)
Community Residents	Improved environmental comfort	0%
	Increased physical activity	0%
	Improved respiratory health	0%
	Reduced frequency and time spent on cleaning house	0%
	Increased sense of safety	0%
	Aroused environmental behavior intentions	0%
	Took environmental protection actions	0%
	Increased a sense of commitment for the community	0%
	Advocated pro-environmental behavior or tree-planting	0%
	College Students	Purchased environmentally friendly products
Took part in other environment related activities		0%
Enhanced empathy to natural environment		0%
Increased willingness in pro-environmental behaviors		1%
Took pro-environment actions		0%
Lamrim Course Attendees	Advocated pro-environmental behavior or tree-planting	1%
	Took pro-environment actions	14%
	Took part in other environment related activities	9%
Rotary Club, District 3481	Encouraged family members or friends to take pro-environment actions	8%
	Encouraged organization to engage in corporate social responsibility actions	0%
Hotai Motor	Facilitated and expanded scope of networking for organization	0%
	Facilitated corporate's pro-environmental practices	0%
	Enhanced corporate reputation	0%
	Enhanced employee engagement	0%

	Enhanced dealer engagement	0%
	Enhanced team's competencies and effectiveness	0%
TOAF	Enhanced team resilience	0%
	Gained organization resources	0%
	Gained government and academic partnerships	0%
Zen Zhou Co.	Enhanced team's core competencies	0%
	Gained organization resources	0%
	Had a sense of self-worth	0%
Afforestation Team Members	Improved communication skills	0%
	Enhanced social contribution	0%
	Increased pro-environment commitment	0%
	Enhanced a sense of achievement	0%
	Deteriorated physical conditions	0%

6.3 Attribution

Attribution is a percentage applied to a proxy based on the extent to which other organizations have contributed to achieving an outcome. This approach considers external factors that may have played a role in the identified changes, thus avoiding overestimating project impact. To determine the level of attribution in this analysis, we also utilized the stakeholder consultation approach as the displacement. Stakeholders were asked to evaluate whether the outcomes they experienced could also be attributed to other organizations or activities. Respondents provided their assessments on a scale from 0% to 100%, where 0% indicated no contribution from other organizations or activities, and 100% suggested that the outcome was entirely due to external influences. For instance, a rating of 40% would imply that the stakeholder believes the outcome was 40% attributable to the efforts of other organizations or activities. These individual assessments were then averaged to calculate the attribution ratio for each outcome. Additionally, stakeholders were asked to explain the reasoning behind their given percentages, providing a rationale for their judgments. This qualitative input ensured a deeper understanding of the context and factors considered by stakeholders when attributing outcomes, enhancing the robustness and validity of the analysis.

The attribution data shown in Table 24 aligns with the findings in the Counterfactual section, where the Community Residents stakeholder group exhibits the lowest attribution percentages. This indicates that the majority of residents firmly believe that the outcomes would not have materialized without the afforestation project. Specifically, low attribution scores such as 5% for "Improved respiratory health" and 11% for "Improved environmental comfort" suggest that 95% and 89% of these outcomes, respectively, are attributed directly to the Wanli Project. In contrast, other stakeholder groups and sub-groups recognize that the outcomes owe their existence to a broader spectrum of factors. For example, College Students' outcome "Enhanced empathy to natural environment" has an attribution score of 45%, indicating that less than half of this outcome is attributed solely to the project. Similarly, outcomes for Hotai Motor such as "Enhanced corporate reputation" with a 50% attribution score suggest that other concurrent initiatives and external influences played significant roles in these changes. Therefore, for other stakeholder groups,

simultaneous initiatives also contributed to the experienced changes. This reflects a more complex interplay of factors affecting these stakeholders, compared to the more direct impact observed among the Community Residents. This nuanced understanding helps to accurately assess the Wanli Project's relative contribution to the diverse outcomes experienced by different stakeholder groups.

Table 24. Attribution Estimates for Well-Defined Outcomes

Stakeholder	Well-Defined Outcomes	Attribution (%)
Community Residents	Improved environmental comfort	11%
	Increased physical activity	1%
	Improved respiratory health	5%
	Reduced frequency and time spent on cleaning house	5%
	Increased sense of safety	7%
	Aroused environmental behavior intentions	0%
	Took environmental protection actions	7%
	Increased a sense of commitment for the community	10%
	Advocated pro-environmental behavior or tree-planting	16%
College Students	Purchased environmentally friendly products	33%
	Took part in other environment related activities	40%
	Enhanced empathy to natural environment	45%
	Increased willingness in pro-environmental behaviors	33%
	Took pro-environment actions	37%
	Advocated pro-environmental behavior or tree-planting	31%
Lamrim Course Attendees	Took pro-environment actions	49%
	Took part in other environment related activities	63%
	Encouraged family members or friends to take pro-environment actions	43%
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	30%
	Facilitated and expanded scope of networking for organization	30%
Hotai Motor	Facilitated corporate's pro-environmental practices	20%
	Enhanced corporate reputation	50%
	Enhanced employee engagement	50%
	Enhanced dealer engagement	50%
TOAF	Enhanced team's competencies and effectiveness	50%
	Enhanced team resilience	50%
	Gained organization resources	20%
	Gained government and academic partnerships	20%
Zen Zhou Co.	Enhanced team's core competencies	60%
	Gained organization resources	60%
Afforestation Team Members	Had a sense of self-worth	40%
	Improved communication skills	30%
	Enhanced social contribution	40%
	Increased pro-environment commitment	55%
	Enhanced a sense of achievement	53%
	Deteriorated physical conditions	50%

6.4 Drop-off

Drop-off refers to the decrease in the value of an outcome over time. Typically, the effects of outcomes diminish gradually as time elapses. When projecting future values, it is crucial to account for the drop-off effect. Similar to attribution and displacement, the stakeholder consultation approach was adopted to measure drop-off. Stakeholders were asked to estimate the annual rate of decline for a given outcome on a scale from 0% to 100%. These estimates were then averaged to calculate the drop-off percentage for each change. Additionally, stakeholders were encouraged to qualitatively describe their perceptions of the drop-off effect and provide the rationale behind their quantitative estimates. This approach allowed for a comprehensive understanding of both the numerical decline and the contextual factors influencing stakeholders' perceptions of the drop-off. Table 25 presents the drop-off estimates for well-defined outcomes across various stakeholder groups involved in the Wanli Project. For Community Residents, the drop-off rates are remarkably low, with most outcomes showing a drop-off of only 2% to 4%. This suggests that the benefits they experienced are likely to sustain over an extended period. College Students exhibit higher drop-off rates, such as 31% for "Advocated pro-environmental behavior or tree-planting" and 28% for "Took part in other environment-related activities," indicating a more significant reduction in impact over time.

For organizational stakeholders like Hotai Motor, the drop-off rates for outcomes such as "Facilitated corporate's pro-environmental practices," "Enhanced corporate reputation," and "Enhanced dealer engagement" are uniformly set at 20%, reflecting a moderate decline in impact. In contrast, TOAF and Zen Zhou Co. show varying drop-off rates, with outcomes like "Enhanced team's competencies and effectiveness" and "Gained organization resources" having 0% drop-off, suggesting a lasting impact. However, for Afforestation Team Members, outcomes like "Had a sense of self-worth" and "Deteriorated physical conditions" have higher drop-off rates of 50%, indicating a significant decline in these effects over time.

Overall, the table highlights the sustainability of the project's impacts on different stakeholders, with drop-off rates providing insight into the longevity and diminishing returns of the outcomes experienced.

Table 25. Drop-off Estimates for Well-Defined Outcomes

Stakeholder	Well-Defined Outcomes	Drop-off (%)
Community Residents	Improved environmental comfort	3%
	Increased physical activity	4%
	Improved respiratory health	2%
	Reduced frequency and time spent on cleaning house	3%
	Increased sense of safety	3%
	Aroused environmental behavior intentions	3%
	Took environmental protection actions	3%

	Increased a sense of commitment for the community	3%
	Advocated pro-environmental behavior or tree-planting	4%
College Students	Purchased environmentally friendly products	18%
	Took part in other environment related activities	28%
	Enhanced empathy to natural environment	26%
	Increased willingness in pro-environmental behaviors	23%
	Took pro-environment actions	16%
	Advocated pro-environmental behavior or tree-planting	31%
Lamrim Course Attendees	Took pro-environment actions	14%
	Took part in other environment related activities	9%
	Encouraged family members or friends to take pro-environment actions	6%
Rotary Club, District 3481	Encouraged organization to engage in corporate social responsibility actions	17%
	Facilitated and expanded scope of networking for organization	17%
Hotai Motor	Facilitated corporate's pro-environmental practices	20%
	Enhanced corporate reputation	20%
	Enhanced employee engagement	20%
	Enhanced dealer engagement	20%
TOAF	Enhanced team's competencies and effectiveness	0%
	Enhanced team resilience	0%
	Gained organization resources	0%
	Gained government and academic partnerships	0%
Zen Zhou Co.	Enhanced team's core competencies	30%
	Gained organization resources	33%
Afforestation Team Members	Had a sense of self-worth	50%
	Improved communication skills	10%
	Enhanced social contribution	15%
	Increased pro-environment commitment	5%
	Enhanced a sense of achievement	13%
	Deteriorated physical conditions	50%

6.5 Calculating Impact

To calculate the impact of the Wanli Project, the following steps were employed:

1. Financial Proxy and Quantity:

- First, determine the financial proxy for each well-defined outcome. This proxy reflects the monetary value of the outcome.
- Multiply the financial proxy by the quantity of the outcome, which is the number of stakeholders experiencing the change, to get the total value.

$$\text{Total Value} = \text{Financial Proxy} \times \text{Quantity of Outcomes}$$

2. Adjust for Counterfactual, Attribution, and Displacement:

- Apply percentages for counterfactual, attribution, and, if applicable, displacement to adjust the total value. These percentages represent the portion of the outcome that would have occurred without the project (counterfactual), the portion attributed to other factors or interventions (attribution), and the extent to which the recorded outcomes have replaced other existing outcomes (displacement).
- Calculate the adjusted value for each outcome using the formula:

$$\text{Adjusted Value} = \text{Total Value} \times (1 - \text{Counterfactual}) \times (1 - \text{Attribution}) \times (1 - \text{Displacement})$$

3. Calculate the Impact for Each Outcome: Repeat the above steps for each well-defined outcome to determine the impact for each. This process ensures that all factors affecting the value of outcomes are accounted for, resulting in a more accurate measure of the project's impact.

Table 26 presents the detailed calculations of impact for well-defined outcomes experienced by Community Residents as part of the Wanli Project. For example, "Improved environmental comfort" was experienced by 513 residents, with a financial proxy of NTD 36,967 and adjustments of 11% for counterfactual and 11% for attribution, leading to an impact value of NTD 5,257,504. Similarly, other outcomes like "Increased physical activity" and "Improved respiratory health" are also presented, showing the comprehensive financial impact on the community residents. The impact calculations are instrumental in understanding the overall social value created by the project for this stakeholder group.

Table 26. Impact Calculation for Community Residents

Well-defined outcomes	No. of Ppl. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Improved environmental comfort	513	0.35	36,967	11%	0%	11%	5,257,504
Increased physical activity	158	NA	46,475	35%	0%	1%	4,725,253
Improved respiratory health	197	0.38	15,600	16%	0%	5%	931,917
Reduced frequency and time spent on cleaning house	256	0.37	12,337	11%	0%	5%	988,018
Increased sense of safety	197	0.32	16,500	10%	0%	7%	870,614
Aroused environmental behavior intentions	118	0.40	3,700	14%	0%	0%	150,190
Took environmental protection actions	59	0.39	14,163	27%	0%	7%	221,247
Increased a sense of commitment for the community	99	0.32	10,000	22%	0%	10%	222,394
Advocated pro-environmental behavior or tree-planting	197	0.47	3,000	17%	0%	16%	193,661

Table 27 presents the impact calculation for College Students. For each outcome, the impact is calculated by considering these factors. For instance, "Purchased environmentally friendly products" had 34 people experiencing a 0.30 distance traveled, with a financial proxy of NTD 7,200, counterfactual of 50%, displacement of 3%, and attribution of 33%, resulting in an impact calculation of NTD 23,864. Similarly, other outcomes such as "Enhance environmental empathy" and "Took pro-environment actions" are analyzed to determine their respective impacts, providing a comprehensive understanding of the project's influence on college students.

Table 27. Impact Calculation for College Students

Well-defined outcomes	No. of Ppl. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Purchased environmentally friendly products	34	0.30	7,200	50%	3%	33%	23,864
Took part in other environment related activities	51	0.07	2,000	42%	0%	40%	2,485
Enhance environmental empathy	101	0.15	3,500	52%	0%	45%	13,999
Increased willingness in pro-environmental behaviors	84	0.17	3,720	42%	1%	33%	20,437
Took pro-environment actions	59	0.13	10,000	41%	0%	37%	28,509
Advocated pro-environmental behavior or tree-planting	84	0.15	2,000	29%	1%	31%	12,253

Table 28 illustrates the impact calculation for Lamrim Course Attendees. For each outcome, the impact is derived by integrating these factors. For instance, "Took pro-environment actions" had 27 participants with a 0.31 distance traveled, a financial proxy of 12,000 NTD, counterfactual of 40%, displacement of 14%, and attribution of 49%, leading to an impact calculation of 26,432 NTD. Similarly, other outcomes such as "Took part in other environment related activities" and "Encouraged family members or friends to take pro-environment actions" are assessed to determine their respective impacts, providing a detailed understanding of the project's influence on Lamrim Course Attendees.

Table 28. Impact Calculation for Lamrim Course Attendees

Well-defined outcomes	No. of Ppl. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Took pro-environment actions	27	0.31	12,000	40%	14%	49%	26,432
Took part in other environment related activities	20	0.20	9,000	60%	9%	63%	4,848
Encouraged family members or friends to take pro-environment actions	27	0.15	7,200	51%	8%	43%	7,493

Table 29 presents the impact calculation for the Rotary Club, District 3481. The impact calculations for these outcomes are NTD 36,750 and NTD 62,475, respectively, demonstrating the financial value generated by these organizational changes.

Table 29. Impact Calculation for Rotary Club, District 3481

Well-defined outcomes	No. of Org. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Encouraged organization to engage in corporate social responsibility actions	1	0.25	300,000	30%	0%	30%	36,750
Facilitated and expanded scope of networking for organization	1	0.17	750,000	30%	0%	30%	62,475

Table 30 details the impact calculation for Hotai Motor as part of the Wanli Project. The table includes four well-defined outcomes: "Facilitated corporate's pro-environmental practices," "Enhanced corporate reputation," "Enhanced employee engagement," and "Enhanced dealer engagement." For each outcome, the table lists the number of organizational entities experiencing change, the distance traveled (indicating the degree of change), financial proxies (in NTD), and percentages for counterfactual, displacement, and attribution. The resulting impact calculations are NTD 770,000 for facilitating pro-environmental practices, NTD 823,112 for enhancing corporate reputation, NTD 242,097 for enhancing employee engagement, and NTD 97,159 for enhancing dealer engagement. These figures reflect the financial value created for Hotai Motor through these specific organizational changes.

Table 30. Impact Calculation for Hotai Motor

Well-defined outcomes	No. of Org. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Facilitated corporate's pro-environmental practices	1	0.25	5,500,000	30%	0%	20%	770,000
Enhanced corporate reputation	1	0.31	4,148,750	20%	0%	20%	823,112
Enhanced employee engagement	1	0.25	3,873,544	50%	0%	50%	242,097
Enhanced dealer engagement	1	0.30	1,295,449	50%	0%	50%	97,159

Table 31 outlines the impact calculation for TOAF within the Wanli Project. The resulting impact calculations are NTD 9,113 for enhancing team's competencies and effectiveness, NTD 2,600 for enhancing team resilience, NTD 3,337,360 for gaining organization resources (subdivided into TV news, print news, internet news, Facebook fans, and extra funding), and NTD 96,000 for gaining government and academic partnerships. These figures represent the financial value generated for TOAF through these organizational changes.

Table 31. Impact Calculation for TOAF

Well-defined outcomes	No. of Org. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Enhanced team's competencies and effectiveness	1	0.45	81,000	50%	0%	50%	9,113
Enhanced team resilience	1	0.33	31,200	50%	0%	50%	2,600
Gained organization resources	-	-		20%	0%	20%	3,337,360
(1) TV news	-	5	890,000	-	-	-	569,600
(2) Print news	-	19	1,767,000	-	-	-	1,130,880
(3) Internet news	-	53	457,125	-	-	-	292,560
(4) Facebook fan	-	300	10,500	-	-	-	6,720
(5) Extra funding	-	1	2,090,000	-	-	-	1,337,600
Gained government and academic partnerships	-	-		20%	0%	20%	96,000
(1) Government	-	1	100,000	-	-	-	64,000
(2) Academic	-	1	50,000	-	-	-	32,000

Table 32 illustrates the impact calculation for Zen Zhou Co. within the Wanli Project, focusing on two well-defined outcomes: "Enhanced team's core competencies" and "Gained organization resources." For "Enhanced team's core competencies," the table shows one organization experiencing change, with a distance traveled of 0.13, financial proxies valued at NTD 1,050,000, counterfactual at 70%, displacement at 0%, and attribution at 60%, resulting in an impact calculation of NTD 16,380. For "Gained organization resources," the impact is broken down into various media channels, including TV news, print news, internet news, Facebook fans, and Instagram fans. The total impact for gained organization resources is NTD 65,460, with detailed calculations for each media channel. These figures reflect the financial value generated for Zen Zhou Co. through these organizational improvements.

Table 32. Impact Calculation for Zen Zhou Co.

Well-defined outcomes	No. of Org. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Enhanced team's core competencies	1	0.13	1,050,000	70%	0%	60%	16,380
Gained organization resources	-	-	409,125	60%	0%	63%	65,460
(1) TV news	-	1	178,000	-	-	-	28,480
(2) Print news	-	2	186,000	-	-	-	29,760
(3) Internet news	-	3	25,875	-	-	-	4,140
(4) Facebook fan	-	500	17,500	-	-	-	2,800
(5) Instagram fan	-	50	1,750	-	-	-	280

Table 33 presents the impact calculation for Afforestation Team Members involved in the Wanli Project. The table outlines various well-defined outcomes, such as "Had a sense of self-worth," "Improved communication skills," and "Enhanced contribution to social well-being," among others. Each outcome includes the number of people experiencing change, the distance traveled, financial proxies, counterfactual percentages, displacement, and attribution. For example, for the outcome "Had a sense of self-worth," 2 people experienced change with a distance traveled of 0.25, financial proxies valued at NTD 54,000, a counterfactual of 60%, no displacement, and an attribution of 40%, resulting in an impact calculation of NTD 6,480. Similarly, "Improved communication skills" resulted in an impact calculation of NTD 8,602, while "Deteriorated physical conditions" showed a negative impact of NTD -365 due to the adverse effect on health. This table helps quantify the financial value of various outcomes experienced by the Afforestation Team Members.

Table 33. Impact Calculation for Afforestation Team Members

Well-defined outcomes	No. of Ppl. Exp. Chg.	Distance Traveled	Financial Proxies (NTD)	Counterfactual	Displacement	Attribution	Impact Calculation (NTD)
Had a sense of self-worth	2	0.25	54,000	60%	0%	40%	6,480
Improved communication skills	2	0.32	32,000	40%	0%	30%	8,602
Enhance contribution to social well-being	2	0.19	44,000	40%	0%	40%	6,019
Increased pro-environment commitment	2	0.23	24,000	60%	0%	55%	1,987
Enhanced a sense of achievement	3	0.28	37,000	60%	0%	53%	5,843
Deteriorated physical conditions	1	0.17	-4,767	10%	0%	50%	-365

6.6 Mitigating Impact Risks and Verifying Results

Effective impact management requires addressing the various risks that can hinder the achievement and sustainability of desired outcomes. We have taken proactive steps to mitigate the following impact risks:

1. To mitigate evidence risk, we implemented rigorous data collection methodologies, including surveys, interviews, and meetings. This ensures the accuracy and reliability of the data gathered. Additionally, ongoing monitoring and evaluation processes are established to track progress and identify any data gaps promptly.
2. The Wanli Project primarily focuses on tree planting activities, which inherently lowers the external risk. Tree planting is a straightforward and self-contained activity, making it less susceptible to disruptions from political, economic, and environmental changes. Additionally, regular environmental scanning is conducted to monitor potential external factors that could impact the project.
3. The project team addressed stakeholder participation risk by ensuring that the expectations and experiences of stakeholders were accurately understood and incorporated into the project plan. The team adhered to the basic requirements for stakeholder involvement, as outlined in Section 3.3 of this report. This involved engaging stakeholders through consultations, surveys, and regular updates to gather their input and feedback.
4. The drop-off risk, which refers to the probability that positive impacts do not endure, was effectively mitigated for the Community Residents stakeholder group. This is evidenced by the low drop-off rates observed in the data. The low drop-off rates suggest that the benefits of the project, such as improved environmental comfort and increased physical activity, were maintained by the Community Residents, demonstrating successful mitigation of this risk.

5. Average figures on a scale were used to quantify the amount of change in this SROI analysis. To ensure the accuracy and fairness of this approach, we recognized the potential risk of significantly different experiences within each stakeholder group and conducted a Standard Deviation and Range Analysis to mitigate this risk. This statistical analysis allowed us to understand the spread and variability of experiences within each group, highlighting instances where a simple average could obscure significantly different experiences. Our data analysis indicates that the standard deviation and range for each variable are within a reasonable range. Additionally, we complemented the quantitative data with qualitative feedback from stakeholders. Open-ended questions in surveys and follow-up interviews provided deeper insights into individual experiences, uncovering variations that might not be captured by numerical data alone. Based on these findings, the average figures are deemed suitable for the analysis of the Wanli project.
6. To mitigate the potential for double counting of outcomes in our SROI analysis, we employed the following strategies:
 - **Clearly Define Outcomes:** We ensured that each outcome was clearly defined and distinct from others. This required a thorough understanding of how different outcomes relate to one another to avoid overlaps and redundancies.
 - **Identify Dependencies:** We identified any dependencies between outcomes. When multiple outcomes were interrelated, only the most relevant outcome was designated as the well-defined outcome to prevent counting the same change multiple times.
 - **Consult Stakeholders:** We engaged stakeholders to validate the outcomes. Their insights were invaluable in determining whether outcomes were distinct or if they were different expressions of the same underlying change.
 - **Use Materiality Testing:** We applied materiality criteria to determine which outcomes were significant enough to be included in the analysis. This involved assessing the relevance and significance of each outcome to both stakeholders and the overall impact of the project.
 - **Apply Counterfactual, Displacement, and Attribution Adjustments:** These adjustments were applied to ensure that only the portion of the outcome directly attributable to our intervention was included, further reducing the risk of double counting.

This SROI analysis also applies all eight Social Value Principles to mitigate potential impact risks. By adhering to Principle 1, "Involve Stakeholders," detailed in Section 3.3, the project ensures continuous engagement and input from stakeholders, reducing the Stakeholder Participation Risk. Principle 2, "Understand What Changes," comprehensively mapping out the changes and outcomes, is covered in Chapter 2, thereby addressing the Evidence Risk. Through Principle 3, "Value the Things

That Matter," discussed in Section 5.5, the project focuses on what stakeholders value most, mitigating the risk of misalignment. Principle 4, "Only Include What Is Material," ensures that only significant data is considered, as elaborated in Section 5.3, thus enhancing the reliability of the outcomes. Principle 5, "Do Not Overclaim," is crucial in providing a balanced and truthful account, thereby managing the risk of overestimation, and is covered in Chapter 6. By adhering to Principle 6, "Be Transparent," also detailed in Chapter 6, the project maintains open communication and accountability, mitigating transparency-related risks. Principle 7, "Verify the Result," involves rigorous verification processes to ensure the accuracy and validity of the results, thus addressing verification risks, as explained in Chapter 6. Finally, Principle 8, "Be Responsive," ensures that the project remains adaptable and responsive to stakeholder feedback and changing circumstances, thereby effectively managing any unexpected risks that may arise, with details provided in Section 8.4.

To ensure that the reported social value and outcomes are accurate, credible, and robust, aligning with Principle 7: Verify the Result, we have adopted the following approaches:

1. Stakeholder Feedback: Following the guidelines of "Table 1: Stakeholder involvement at different stages of an analysis" under Principle 1: Involve Stakeholders, we engaged stakeholders to review and confirm the findings of the SROI analysis. This step ensures that the analysis reflects the true experiences and perspectives of those affected. Below provides further details on the efforts made to verify the results:
 - 1) To review and verify the theory of change, the range of outcomes, and the relative value/importance of outcomes, as well as to update stakeholders on the progress of our SROI analysis, we adopted different approaches tailored to each group. For Community Residents, we conducted several visits to collect both qualitative and quantitative data directly. During these visits, we also took the opportunity to ask them to review and verify our analysis progress. For the other stakeholder groups, we verified qualitative results during the quantitative data collection process. To ensure the reliability of the quantitative data used for calculating the SROI, we conducted verification calls with approximately 5% of the population for college students and Lamrim course attendees, and with 100% of the organizational stakeholders. This engagement process not only enhances the accuracy and validity of the analysis but also fosters a sense of ownership and trust among stakeholders, as their voices and experiences are directly reflected in the findings.
 - 2) To review and verify the final analysis, we organized at least two face-to-face meetings with the execution team to go over the draft report and provide feedback on the findings, conclusions, and recommendations. Additionally, some stakeholders were invited to these meetings to ensure the results accurately reflected their experiences. They were given the opportunity to raise any concerns or suggest modifications, which were carefully considered and incorporated into the final analysis. By involving stakeholders in the review and verification process, the report meets the assurance standard by ensuring that the SROI findings are accurate, credible, and aligned with the experiences of those most impacted

by the project. This inclusive approach fosters transparency and trust, as stakeholders play a crucial role in validating the project's social impact.

2. **Advice and Audit by a Level 3: Advanced Social Value Practitioner:** The director of the Asian Institute for Impact Measurement and Management, who is an Advanced Social Value Practitioner, provided advice and conducted an audit of the SROI analysis and report. This professional oversight helps to enhance the credibility and accuracy of the findings.
3. **Validation of Data and Assumptions:** We rigorously verified the data sources and assumptions used in the analysis through strict field studies and statistical approaches. These measures ensure that the data is reliable, relevant, and accurately reflects the outcomes. Detailed references and explanations for outcome measurements and cost-based proxies are provided in Section 5.5.2 Monetary Valuation and Appendix B.

In addition, this report will be submitted to Social Value International for report assurance. Verification increases the credibility of the SROI analysis by identifying and correcting any errors or biases, ensuring the reported outcomes are accurate. It promotes transparency by providing a clear account of how the results were obtained and validated. Furthermore, verification can highlight areas for improvement in the SROI process, leading to better practices and more reliable future analyses.

CHAPTER 7: STAGE 5 - CALCULATING THE SROI

7.1 SROI Ratio

To calculate the SROI ratio, the following steps were employed:

1. Calculate the Total Present Value of Benefits: Each well-defined outcome was assigned a financial proxy, reflecting its monetary value. The quantity of outcomes refers to the number of stakeholders experiencing each outcome. The total value is calculated by multiplying the financial proxy by the quantity of the outcome.

2. Adjust for Counterfactual, Displacement, Attribution, and Drop-off: Counterfactual represents the portion of the outcome that would have occurred without the project. Displacement refers to the extent to which the recorded outcomes have replaced other existing outcomes. Attribution accounts for the portion of the outcome attributed to other factors or organizations. Drop-off rates are applied to account for the diminishing impact over time.

3. Calculate the Net Present Value of Benefits: Once the adjusted values for all outcomes are determined, the next step is to calculate the Net Present Value (NPV) of benefits. This involves discounting future benefits to their present value using an appropriate discount rate. The discount rate reflects the time value of money, ensuring that future benefits are appropriately weighted. The formula for calculating the NPV of benefits is:

$$\text{NPV of Benefits} = \sum \left(\frac{\text{Adjusted Value}_{\text{Year } n}}{(1 + \text{Discount Rate})^n} \right)$$

The discount rate in the Wanli Project is based on the Taiwan cash discount rate, which was set at 1.88% per annum in August 2023 and published by the Central Bank of the Republic of China, Taiwan.

Similarly, the total financial value of all inputs, including monetary and non-monetary contributions, is calculated to determine the NPV of investments. This includes costs such as land, saplings, labor, and other resources invested in the project:

$$\text{NPV of Investments} = \sum \left(\frac{\text{Input Cost}_{\text{Year } n}}{(1 + \text{Discount Rate})^n} \right)$$

4. Determine the SROI Ratio: The SROI ratio is calculated by dividing the total present value of benefits by the total present value of investments. In the Wanli Project, the total present value of benefits is NTD 83,442,785, and the total value of inputs is NTD 4,835,780. Therefore, the SROI ratio is calculated as **17.26**. This means that for every **NT\$1** invested in the Wanli Project, a social value of **NT\$17.26** was created. A Value Map Excel file containing the detailed SROI calculations has been submitted to Social Value International for report assurance.

7.2 Sensitivity Analysis

Sensitivity analysis is a crucial component of SROI analysis as it helps to understand the robustness and reliability of the results. Given that SROI calculations involve numerous assumptions and estimates - such as financial proxies, attribution rates, and counterfactual percentages—there is an inherent uncertainty in the analysis. Sensitivity analysis systematically varies these key assumptions to assess how changes in variables impact the overall SROI ratio. This process identifies which variables have the most significant influence on the results, allowing stakeholders to gauge the confidence they can place in the findings. By highlighting the variables that most affect the outcome, sensitivity analysis ensures that decision-makers are aware of the potential range of social value generated, thereby enhancing the transparency, credibility, and usefulness of the SROI analysis. This process aligns with the Principle 6: Be Transparent and helps stakeholders understand the extent to which the results depend on specific assumptions, ultimately supporting more informed decision-making.

In the following discussion, we will conduct a sensitivity analysis on the following variables:

1. Counterfactual, attribution, and drop-off: These factors significantly influence the calculation of net impact by accounting for what would have happened anyway (counterfactual), the extent to which other factors contributed to the outcomes (attribution), and the sustainability of the outcomes over time (drop-off). Small changes in these variables can substantially alter the impact value, thus it's crucial to test their sensitivity.
2. Duration: The length of time over which the outcomes are expected to last affects the total value of benefits. If the assumed duration of benefits is too long or too short, it could misrepresent the project's true impact. Sensitivity analysis helps to understand how changes in this assumption affect the overall SROI ratio.
3. Financial proxies: The monetary values assigned to outcomes are based on estimates and can vary depending on the source or method used. Testing different financial proxies ensures that the SROI analysis remains robust even if these estimates fluctuate.
4. Number of people experiencing change: The scale of impact is directly related to the number of people affected by the outcomes. Variations in this number can significantly change the total value of benefits. Sensitivity analysis ensures that the results are reliable and not overly dependent on specific assumptions about the number of beneficiaries.

By adjusting counterfactual, attribution, and drop-off percentages for each outcome, adding and deducting 10%, we observe only minor deviations from the current SROI estimate (Table 34). The current SROI ratio is 17.26. Adjusting the counterfactual values by adding 10% results in a decreased SROI ratio of 16.75, while deducting 10% increases the SROI ratio to 17.64. Similarly, adding 10% to the attribution values slightly reduces the SROI ratio to 17.02, and deducting 10% raises it to 17.49. For the drop-off values, adding 10% decreases the SROI ratio to 17.12, whereas deducting 10% increases it to 17.39. These adjustments demonstrate the robustness of the SROI ratio against variations in these critical assumptions.

Table 34. Sensitivity Analysis: Counterfactual, Attribution, and Drop-off

Variables	Adjustments	SROI Ratio
	Current SROI Ratio	17.26
Counterfactual	+10% to all counterfactual values	16.75
	-10% to all counterfactual values	17.76
Attribution	+10% to all attribution values	17.02
	-10% to all attribution values	17.49
Drop-off	+10% to all drop-off values	17.12
	-10% to all drop-off values	17.39

By adding or deducting 1 year to the duration for each outcome, we still find minor deviations from the current SROI estimate (Table 35). When the duration of all outcomes is extended by one year, the SROI ratio increases to 17.69. Conversely, when the duration is reduced by one year, the SROI ratio decreases to 16.36. This sensitivity analysis highlights how changes in the assumed duration of outcomes can significantly affect the overall SROI ratio, underscoring the importance of accurate duration estimates in the SROI analysis.

Table 35. Sensitivity Analysis: Duration

Variables	Adjustments	SROI Ratio
	Current SROI Estimate	17.26
Duration	+ 1 year to all durations	17.69
	- 1 year to all durations	16.36

When adjusting each financial proxy by adding or deducting 10%, we observe greater impact to the resulting SROI ratios (Table 36), in particular from the Community Residents stakeholder group. Adjusting all financial proxies by +10% increases the SROI ratio to 18.98, while a -10% adjustment reduces it to 15.53. When the financial proxies related only to Community Residents are increased or decreased by 10%, the SROI ratios adjust to 18.50 and 16.01, respectively. Similarly, adjusting the financial proxies related to non-Community Residents by +10% and -10% results in SROI ratios of 17.74 and 16.77, respectively. These adjustments illustrate the sensitivity of the SROI ratio to changes in the financial proxies, highlighting the importance of accurate and robust proxy selection in the analysis.

Table 36. Sensitivity Analysis: Financial Proxies

Variables	Adjustments	SROI Ratio
	Current SROI Estimate	17.26
Financial proxies	+ 10% to all financial proxies	18.98
	+ 10% to all financial proxies related to Community Residents only	18.50
	+ 10% to all financial proxies related to non-Community Residents only	17.74
	- 10% to all financial proxies	15.53
	- 10% to all financial proxies related to Community Residents only	16.01
	- 10% to all financial proxies related to non-Community Residents only	16.77

Table 37 presents the results of the sensitivity analysis for the scale of Community Residents in the Wanli Project. The analysis examines the impact of varying the number of people who experienced each well-defined outcome by $\pm 10\%$. The table shows the corresponding SROI ratios when the number of people experiencing the changes is increased by 10% and decreased by 10%. For example, if the number of people experiencing improved environmental comfort is increased by 10%, the SROI ratio rises to 17.74, while a 10% decrease results in an SROI ratio of 16.77. The table indicates that variations in the number of people experiencing the outcomes have a relatively modest effect on the overall SROI ratio, demonstrating the robustness of the analysis.

Table 37. Sensitivity Analysis: Scale of Community Residents

Well-defined outcomes	Number of people experienced the changes	
	+10%	-10%
Improved environmental comfort	17.74	16.77
Increased physical activity	17.68	16.83
Improved respiratory health	17.34	17.17
Reduced frequency and time spent on cleaning house	17.35	17.16
Increased sense of safety	17.34	17.17
Aroused environmental behavior intentions	17.27	17.24
Taken environmental protection actions	17.28	17.23
Increased a sense of commitment for the community	17.28	17.23
Advocated pro-environmental behavior or tree-planting	17.27	17.24

CHAPTER 8: STAGE 6 – REPORTING, USING AND EMBEDDING

In this chapter, we will present our analysis of the outcome values for reporting, offer recommendations in accordance with Principle 8: Be Responsive to enhance TOAF's future tree-planting projects, and draw conclusions based on the findings from this SROI analysis.

8.1 Overview of Social Value Distribution

Figure 18 illustrates the distribution of social value generated by the Wanli Project, categorized by different stakeholder groups. The total social value amounts to NT\$83,442,289. This value is segmented into contributions from four main stakeholder groups: Community Residents, Project Executors, Sponsor (Hotai Motor), and Educational Participants. Community Residents account for the largest share, generating NT\$59,981,896 (71.88%), which highlights their significant role in the project's impact. Moreover, this group experiences the least erosion across the four impact factors. Project Executors (TOAF, Zen Zhou Co. and Afforestation Team Members) contribute NT\$16,470,556, while the Sponsor, Hotai Motor, adds NT\$6,167,617.53 to the total value. TOAF generates the most substantial social value contribution among Project Executors, primarily due to the additional funding it received after the initiative gained widespread recognition through media coverage and referrals from FANCA. Hotai Motor, also underwent changes considered highly valuable, particularly regarding the outcomes of 'Facilitated corporate's pro-environmental practices' and 'Enhanced corporate reputation'. Lastly, Educational Participants contribute NT\$822,219.88. This breakdown demonstrates the varied contributions of each stakeholder group to the overall social value created by the project, emphasizing the multifaceted impact of the Wanli Project.

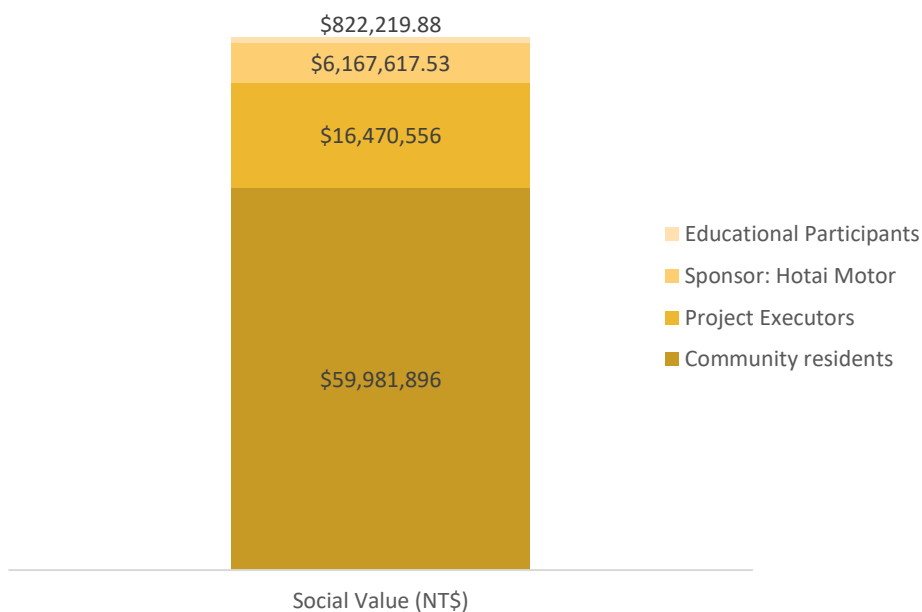


Figure 18. Distribution of Social Value Generated by the Wanli Project by Stakeholder Group

In the following analysis, stakeholders are categorized into two groups: individual stakeholders and organizational stakeholders. Figure 19 illustrates the distribution of social value generated between these two groups. The data reveals that individual stakeholders account for a significant portion of the total social value, with a contribution of NTD 60,700,419, representing 73% of the total social value created. In contrast, organizational stakeholders contribute NTD 22,741,871, which is 27% of the total social value. This distribution highlights the substantial impact the Wanli Project has had on individual community members compared to the organizations involved.

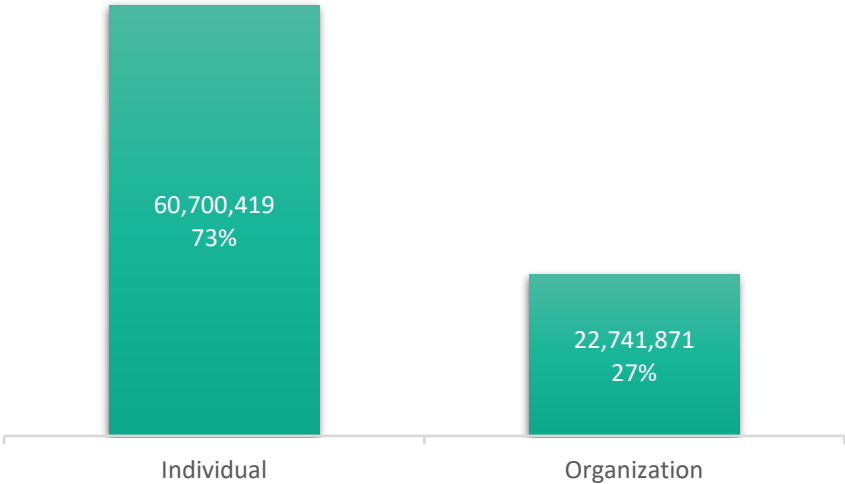


Figure 19. Distribution of Social Value between Individual and Organizational Stakeholders

The breakdown of the social value for individual stakeholders generated by the Wanli Project is shown in Figure 20. The majority of the social value, NTD 59,981,896, which represents a substantial portion of the total, is attributed to Community Residents. Educational Participants are divided into two sub-groups: College students (SG1), who contributed NTD 294,744 (0.49%), and Lamrim course attendees (SG2), who contributed NTD 148,585 (0.24%). These figures indicate that while educational participants benefitted from the project, their share of the total social value is considerably smaller compared to community residents. Additionally, Afforestation Team Members contributed NTD 275,193, accounting for 0.45% of the total social value. The Community Residents stakeholder group emerges as the primary source of social value, reflecting the largest number of individuals experiencing the most significant changes over an extended period with minimal erosion across the four impact factors. In contrast, the educational participants generated lower social value due to the smaller number of participants, lower financial proxies' value, and higher counterfactual and attribution ratios. Members of the TOAF Afforestation Team, despite their strong commitment and significant changes, assigned higher counterfactual and attribution ratios, reflecting the difficulty in gauging the contribution from this particular initiative amid their engagement in various projects. This distribution highlights the significant impact on Community Residents compared to the relatively smaller contributions from educational participants and Afforestation Team Members.

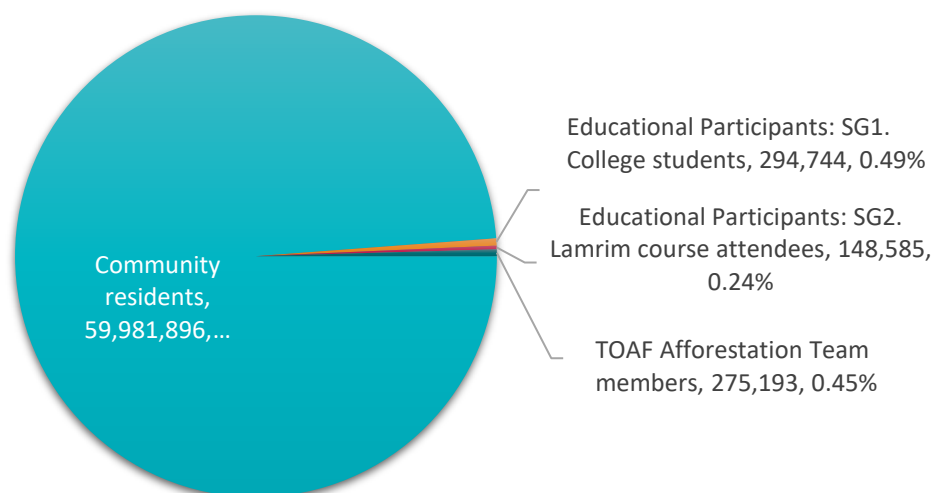


Figure 20. Breakdown of Social Value for Individual Stakeholders

Figure 21 illustrates the distribution of social value among organizational stakeholders generated by the Wanli Project. TOAF makes the most substantial social value contribution, accounting for 70.42% of the total social value, amounting to NTD 16,014,708. This significant contribution is primarily due to the additional funding it received after the initiative gained widespread recognition through media coverage and referrals from the Forestry Management Office.

The sponsor, Hotai Motor, contributed 27.12% of the total social value, amounting to NTD 6,167,618. While Hotai Motor experienced highly valuable changes, particularly in the top two outcomes, the remaining two outcomes related to employee and dealer engagement were assigned relatively high counterfactual and attribution ratios (50%), which diminished the generated social value.

Educational participants, represented by the Rotary Club-District 3481, contributed 1.67% of the total social value, totaling NTD 378,890. The district governor's dedication to promoting the cause led to the club initiating its own tree-planting activity and facilitating experience sharing within its networks, generating a relatively high level of social value.

Project executors, represented by Zen Zhou Co., contributed the least social value at 0.79%, amounting to NTD 180,655. High counterfactual and attribution ratios, ranging between 60% to 70%, were assigned due to the company being a newly established startup in 2017 and being involved in various initiatives simultaneously. Consequently, other projects also contributed to the transformative experiences, leading to the least social value generation from this group.

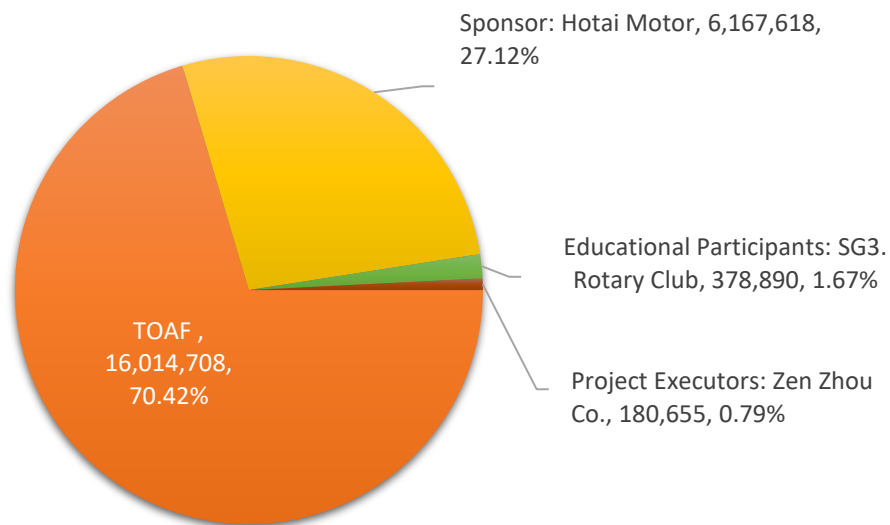


Figure 21. Breakdown of Social Value for Organizational Stakeholders

8.2 Outcomes Value Analysis – By Stakeholder Groups and Sub-Groups

In this section, we will analyze the value of well-defined outcomes for each stakeholder group and sub-group involved in the Wanli Project. Figure 22 The figure illustrates the distribution of social value among the well-defined outcomes for community residents. Coastal afforestation provides numerous benefits, including sand suppression, air purification, temperature regulation, and improved air quality. Consequently, improvements in "environmental comfort" (40%) and the resulting "increase in physical activity" (35%) are highly valued changes among community residents.

The next tier of changes includes "improved respiratory health" (7%), "reduced frequency and time spent on house cleaning" (7%), and "enhanced sense of safety" (6%). These five outcomes collectively account for approximately 94.42% of the total value for this stakeholder group, highlighting the strong alignment of the Wanli reforestation project with the objectives and benefits of coastal afforestation.

The remaining four well-defined outcomes - "aroused environmental behavior intentions," "taken environmental protection actions," "increased a sense of commitment for the community," and "advocated pro-environmental behavior or tree-planting" - represent a total of approximately 5.58% of the outcome value for this stakeholder group. This smaller proportion is mainly due to the residents being elderly and therefore less receptive to conceptual changes.

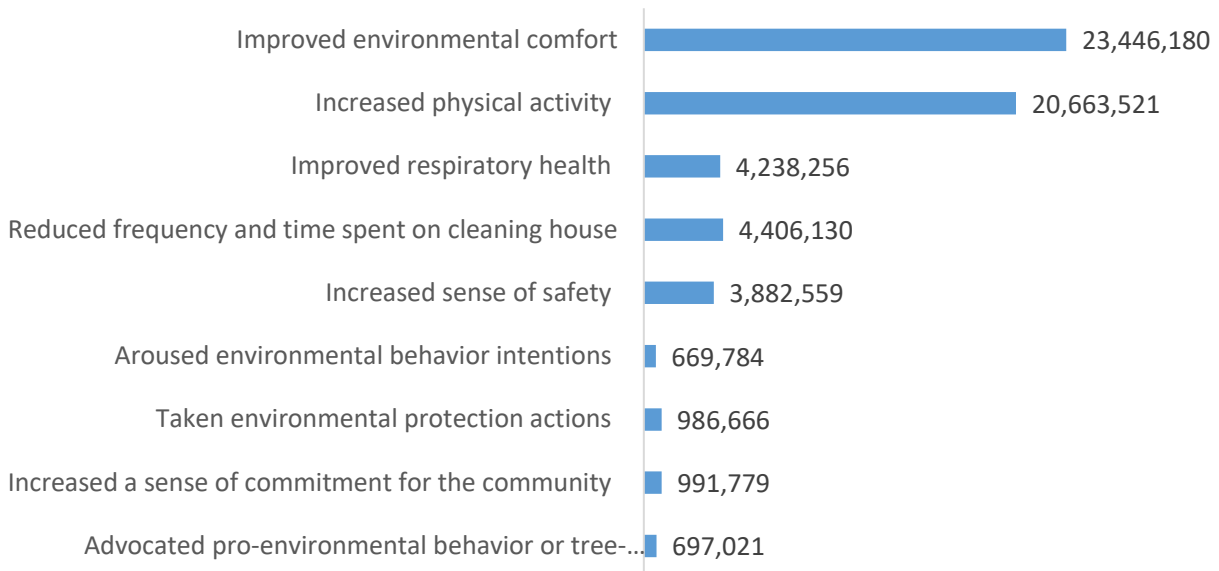


Figure 22. Breakdown of Social Value Generated by Community Residents

Among college students, the most substantial outcome is "Took pro-environment actions," valued at NTD 87,375, representing 29.8% of the total value. Close behind is "Purchased environmentally friendly products" with a value of NTD 80,990, accounting for 27.6%. "Increased willingness in pro-environmental behaviors" follows, valued at NTD 56,379, which is 19.2% of the total. The outcome "Enhanced empathy to the natural environment" is valued at NTD 36,916, making up 12.6%. "Advocated pro-environmental behavior or tree-planting" has a value of NTD 26,106, constituting 8.9%. The smallest value is for "Took part in other environment-related activities," valued at NTD 6,979, which accounts for 2.4% of the total outcome value for this stakeholder group. This distribution underscores the importance of proactive environmental actions and the purchase of eco-friendly products among college students in the Wanli Project, as illustrated in Figure 35.

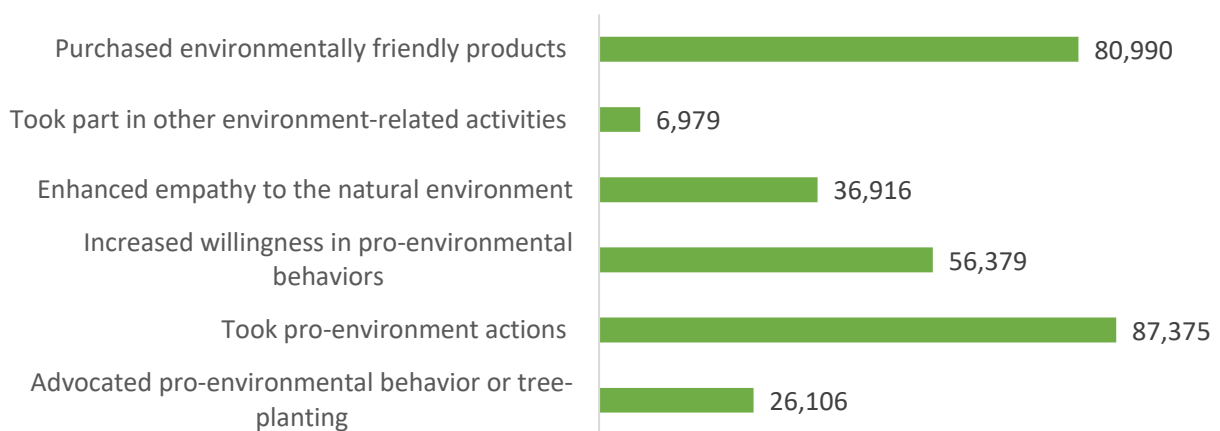


Figure 23. Breakdown of Social Value Generated by College Students

For Lamrim Course Attendees, the largest contribution comes from those who "took pro-environment actions," accounting for NT\$96,897, which represents 66% of the total social value for this group. "Encouraged family members or friends to take pro-environment actions" contributed NT\$32,100, making up 22% of the total value. Lastly, "took part in other environment-related activities" contributed NT\$19,589, which accounts for 13% of the social value. This distribution highlights the significant emphasis on direct pro-environment actions among Lamrim Course Attendees (Figure 23).

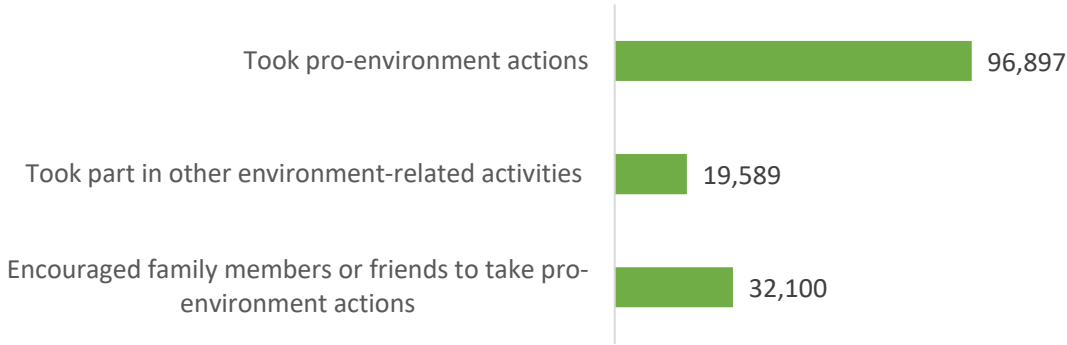


Figure 23. Breakdown of Social Value Generated by Lamrim Course Attendee

For the Rotary Club - District 3481, two well-defined outcomes stand out: "Facilitated and expanded scope of networking for organization," which accounts for approximately 62.9% of the social value (NTD 238,561), and "Encouraged organization to engage in corporate social responsibility actions," which contributes 37.1% (NTD 140,330). This distribution highlights the Rotary Club's focus on expanding their networking capabilities and promoting CSR actions, reflecting the organization's strategic priorities and the project's impact in these areas. As the governor of the Rotary Club mentioned, the Wanli Project enabled the Club to network and exchange experiences with peers in the Rotary International network, fostering increased organizational networking. However, due to synchronization with its global campaign, the counterfactual and attribution ratio is 30%, weakening the social value generated. Figure 24 shows the breakdown of social value generated by the Rotary Club, District 3481, as a result of the Wanli Project.

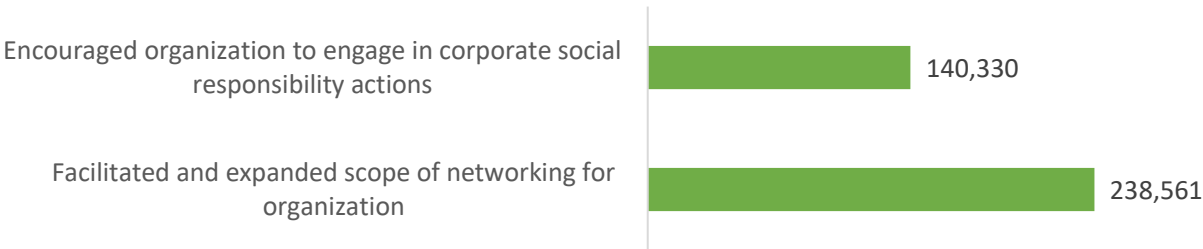


Figure 24. Breakdown of Social Value Generated by Rotary Club, District 3481

For Hotai Motor, the social value generated is primarily driven by two well-defined outcomes: "Facilitated corporate's pro-environmental practices," which accounts for approximately 41.4% of the total social value (NTD 2,514,977), and "Enhanced corporate reputation," contributing 44.2% (NTD 2,688,452). These changes have comparatively lower counterfactual and attribution ratios, resulting in the highest social value.

Additionally, "Enhanced employee engagement" contributes 13.0% (NTD 790,737), and "Enhanced dealer engagement" adds a smaller portion of 2.9% (NTD 173,451). This distribution underscores Hotai Motor's focus on improving environmental practices and corporate reputation, while also highlighting the positive, albeit smaller, impacts on employee and dealer engagement. Even though the generated social value is not particularly high, during the stakeholder interview with Hotai Motor, they mentioned that the Wanli Project had a positive impact both internally and externally. Internally, the company became more committed to pro-environmental practices, such as promoting energy-saving measures in the office, and encouraging employees to reduce printing papers and cut down electricity usage. Externally, the "One Car, One Tree" campaign garnered widespread acclaim and recognition from car owners. This campaign also won the full support from dealers' which was not common. The campaign continues to this day for the seventh consecutive year. Figure 25 shows the breakdown of social value generated by Hotai Motor as a result of the Wanli Project.

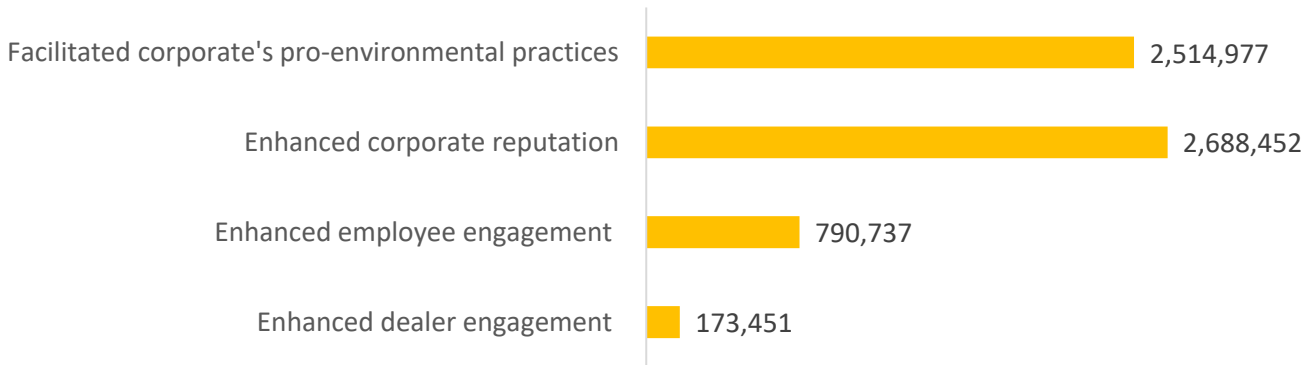


Figure 25. Breakdown of Social Value Generated by Hotai Motor

Figure 26 illustrates the breakdown of social value generated by Zen Zhou Co. through two key well-defined outcomes. "Gained organization resources" accounted for the majority of the social value at 75.4% (NTD 136,324). In contrast, "Enhanced team's core competencies" contributed 24.6% (NTD 44,331) to the total social value. This distribution indicates that Zen Zhou Co. experienced a significant boost in organizational resources, which constituted the primary impact of the Wanli Project, while the enhancement of the team's core competencies played a lesser, yet still notable, role in the overall value generated.



Figure 26. Breakdown of Social Value Generated by Zen Zhou Co.

Figure 27 presents the breakdown of social value generated by the Afforestation Team Members. The most significant contributions came from "Improved communication skills," which accounted for 55.3% (NTD 126,789), and "Had a sense of self-worth," which contributed 43.6% (NTD 99,891). Other notable outcomes included "Enhanced social contribution" at 9.4% (NTD 21,643), "Enhanced a sense of achievement" at 8.2% (NTD 18,732), and "Increased pro-environment commitment" at 3.8% (NTD 8,682). Notably, "Deteriorated physical conditions" had a negative impact, accounting for -0.2% (NTD -544). It was attributed to physical injuries sustained during project activities, but its depth, extent of impact, and importance are low. This distribution indicates that the team members experienced the most value in improved communication skills and a sense of self-worth, while the negative impact on physical conditions slightly offset the overall positive outcomes.

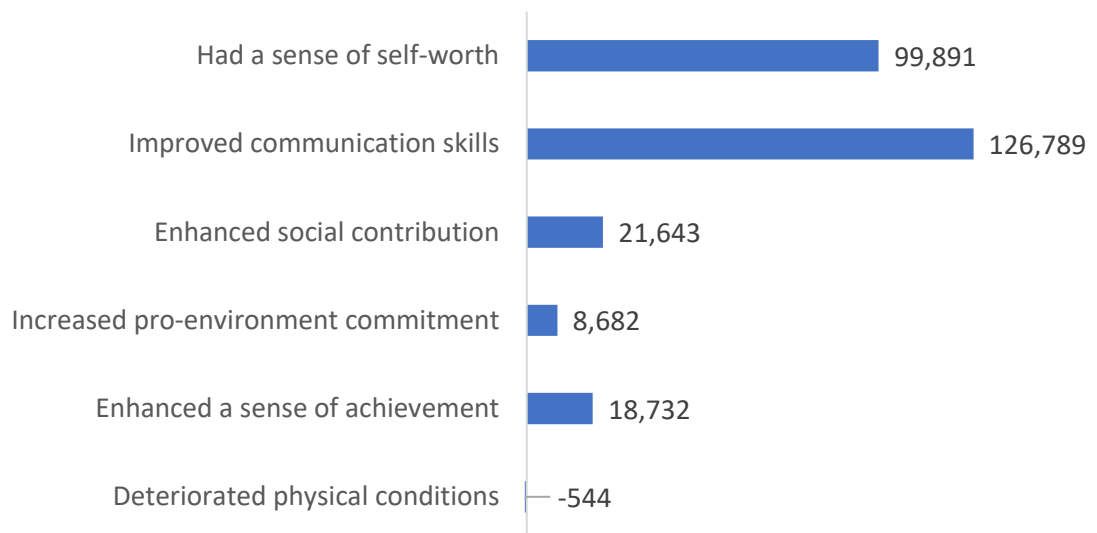


Figure 27. Breakdown of Social Value Generated by Afforestation Team Members

The final analysis in this Section is depicted in Figure 28, showing the breakdown of social value generated by TOAF. The most significant contribution comes from "Gained organization resources," which accounts for an overwhelming 96.2% (NTD 15,397,673) of the total social value. This outcome underscores the importance of the additional resources TOAF secured as a result of the project. "Gained government and academic partnerships" contributed 3.4% (NTD 550,072), reflecting the

value of new collaborations established. "Enhanced team's competencies and effectiveness" added 0.3% (NTD 52,214), while "Enhanced team resilience" provided 0.1% (NTD 14,749). This analysis highlights the substantial impact on organizational resources and the ancillary benefits of enhanced partnerships and team capabilities.

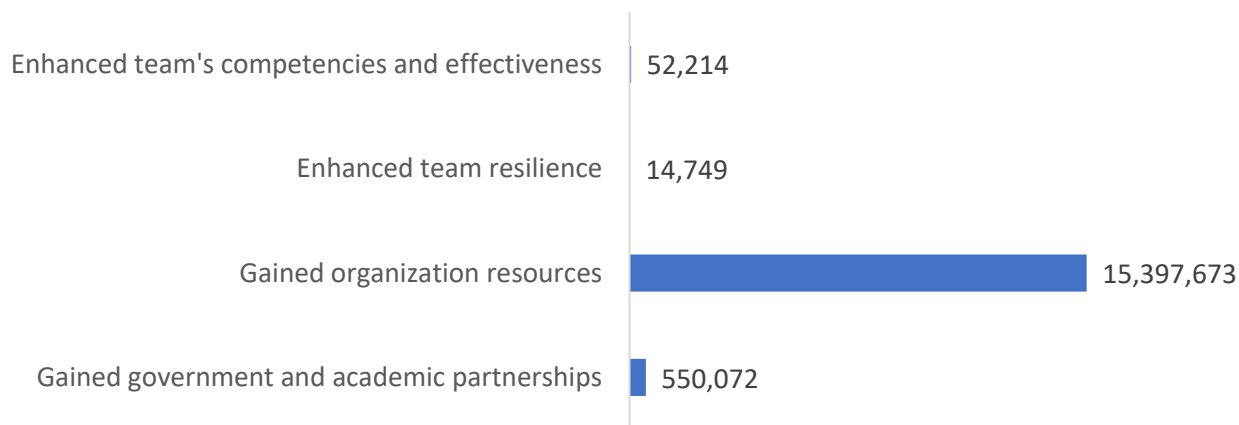


Figure 28. Breakdown of Social Value Generated by TOAF

8.3 Be Responsive

The eighth Principle of Social Value, 'Be Responsive,' was introduced by SVI in 2021 as a management principle within the SROI framework. This principle emphasizes the necessity for organizations to take action based on the data and insights gathered, aiming to optimize the impacts on the well-being of materially affected stakeholder groups. Adhering to this principle involves developing a systematic 'impact management approach' to inform decision-making across strategic, tactical, and operational levels of social value accounts.

8.3.1 Suggested Areas for Development

By examining respective stakeholders' social value, the scale of impact (number of individuals affected), the depth of change, and other impact factors, we also identified several areas for improvement.

1. Community Residents

In terms of scale and depth of change, the least valued outcomes are: 'Arousing environmental behavior intentions,' 'Advocate pro-environmental behaviors or tree-planting,' 'Increasing sense of environmental commitment for the community,' and 'Took environmental protection actions.' This can be attributed to the predominantly elderly population in the community, necessitating greater

efforts to drive conceptual change. The elderly demographic tends to have established habits and attitudes, making it more challenging to instill new environmental behaviors and commitments. Therefore, TOAF plans to enhance communication and education efforts to promote these changes more effectively.

To address these challenges, TOAF also plans to develop an impact management system to better understand the characteristics of stakeholders. This system will allow TOAF task owners to enlist local community representatives to host meetings or workshops at the project's commencement and during its execution. These sessions will clarify afforestation goals, benefits, expected outcomes, and address any concerns or inquiries from residents. By involving trusted community members in these discussions, TOAF can build stronger relationships and trust, facilitating a more receptive environment for change.

Additionally, TOAF will invite more local residents to participate in educational tree-planting activities. These activities are designed to foster a deeper emotional connection to the afforestation site, thereby strengthening residents' sense of community dedication and environmental stewardship. By actively engaging community residents in hands-on activities, TOAF aims to transform abstract concepts into tangible experiences, making the importance of environmental protection more relatable and urgent.

Throughout this process, TOAF will maintain open communication channels, conduct more reliable data collection, and share data for internal discussions and decision-making to ensure timely and informed actions. Regular feedback loops will be established to continuously monitor progress and adapt strategies as needed. This comprehensive approach aims to achieve greater scale and depth of positive change within the community by addressing both practical and perceptual barriers. By committing to ongoing education, transparent communication, and active community involvement, TOAF seeks to create a lasting and meaningful impact that aligns with the long-term goals of the tree-planting projects.

2. Educational Participants

The educational participants came from various organizations, and notably, the primary changes observed were those linked to pro-environmental intentions and behaviors. However, the depth of these changes tends to be relatively modest, with higher counterfactual and attribution ratios. This is understandable given that the participants' engagement in the program was limited, and TOAF does not maintain enough ongoing professional engagement with these organizations to sustain the impacts.

To address this, TOAF will consider implementing a long-term afforestation education program and integrating it into the impact management system to effectively monitor its results. For example, TOAF could launch a sustained campus education campaign, recruit volunteers, and engage them for longer durations. This approach would not only deepen the impact on participants' pro-environmental behaviors but also ensure a more consistent and measurable contribution to the overall objectives of the afforestation initiative. By fostering longer-term relationships and providing

continuous educational opportunities, TOAF aims to significantly enhance the depth of change and reduce the counterfactual and attribution ratios. This strategy will help in creating a more profound and lasting impact on the participants, ensuring that their pro-environmental intentions and behaviors are strengthened and sustained over time.

3. Project Executors

The data showed that while significant positive outcomes were achieved, there are opportunities to enhance the impact further through more structured and strategic approaches. TOAF plans to develop a comprehensive impact management system tailored to the unique needs and contributions of each executor stakeholder. This system will involve regular workshops and training sessions to build the capacity and competencies of the project executors. These sessions will focus on best practices in afforestation, project management, and stakeholder engagement to ensure that all team members are equipped with the necessary skills and knowledge to maximize their contributions.

Additionally, TOAF recognizes the importance of fostering a strong sense of ownership and motivation among project executors. To this end, TOAF plans to introduce recognition and reward programs to acknowledge the efforts and achievements of team members and partners. This could include public recognition in organizational communications, awards for outstanding contributions, and opportunities for professional development.

4. Sponsor

TOAF is evaluating the possibility of integrating the concept of impact measurement and management into its sponsorship working protocol. While some sponsors view sponsorships as short-term CSR campaigns, many forward-thinking sponsors recognize the alignment between tree-planting initiatives and their core business missions or ESG initiatives. If TOAF can incorporate its sponsors into the impact management system from the start, this can expand their understanding from merely offsetting carbon emissions to long-term impact management.

From this SROI study, it also shows that embedding an impact management system within the work unit is crucial for creating social value for all future stakeholders. This need became evident during our study. For instance, when interviewing community residents, we found that many were unaware of which organization had planted the trees and the main objective behind the initiative. While minor misperceptions were mentioned by a few, no material changes were incurred. We understand that this is an adoption project in which TOAF contracted with FMO under FANCA, and past practices dictated direct collaboration with the client, resulting in a lack of prior engagement with local residents before the initiative kick-started. Nevertheless, this finding underscores the importance of clarity and communication in such initiatives.

8.3.2 Developing an impact management system

The TOAF Afforestation Team undertakes various afforestation projects, each with unique characteristics. For instance, in the Wanli reforestation initiative, the materially affected stakeholders include community residents, educational participants, business partners, and the corporate sponsor. Conversely, some projects involve exclusive collaboration with FANCA or local government entities, with afforestation sites located in remote areas lacking residents or suitable opportunities for educational participation. Consequently, implementing a comprehensive responsiveness management system within the organization proves overly complex and inefficient for TOAF, especially considering it is a lean working unit with five full-time staff members at present. Following discussions with TOAF, it is advisable for them to adopt a simplified management system tailored to suitable projects. Suitability is determined by the involvement of people-related stakeholder groups, as exemplified in the Wanli initiative.

The management system entails defining clear roles and responsibilities for establishing the social value accounting framework, collecting and analyzing impact data, making decisions on strategic, tactical, and operational matters, and optimizing the implementation of actions, along with regular review and reporting. The following provides guidelines for TOAF's reference:

- **Social Value Accounting Framework:** Based on the Wanli initiative, we will assist TOAF in developing the framework and provide guidelines to assigned staff as an initial start. They will then be able to modify and apply this framework in subsequent projects.
- **Data Collection:** Each initiative is assigned a project owner responsible for liaising with the local committee or collaborating institutions to collect impact data. Data will be collected pre-tree-planting activity, post-tree-planting activity, and annually thereafter. Given the slow growth of trees and to avoid disturbing stakeholders, annual data collection is deemed appropriate. For the initial pre- and post-tree-planting activity data collection, we can assist TOAF, and they can handle the annual data collection independently.
- **Data Analysis and Decision Making:** The pre- and post-tree-planting data will be analyzed to identify any immediate changes for stakeholder groups. Any necessary adjustments and decisions will be made by the Afforestation Team Director.
- **Annual Reporting:** Upon project finalization, an annual report will be produced and presented in an internal meeting to the Afforestation Team's upper supervisor and the TOAF chairman.
- **Communication Channels:** Communication channels within the organization and with external stakeholder groups should be established. Based on the characteristics of respective stakeholder groups, TOAF will set up communication channels for sharing impact data and updates, informing them about meaningful changes. This may include local committee meetings, email updates, project management systems, or dedicated data-sharing platforms where available.

This comprehensive approach ensures TOAF can effectively manage and optimize the impacts of its afforestation projects, fostering greater scale and depth of positive change within the community.

8.4 Summary and Conclusions

This SROI study adopts a stakeholder-based approach to evaluate the social impacts generated by the Wanli Project. Below are the key takeaways summarized from this study:

- The initiative generated NT\$17.26 social value for every NT\$1 invested.
- The primary beneficiaries are the Community Residents, representing the largest stakeholder group, who experienced a significant and valuable array of changes.
 - The reforestation project serves as a windbreaker, reducing the influx of sand from the sea and thereby improving the environmental conditions. This leads to a series of positive changes, including increased environmental comfort, higher frequency of exercise in the community, improved respiratory health, and a reduction in the need for house cleaning.
- The TOAF is the second major beneficiary due to the additional resources gained following the widespread media coverage of the tree-planting project.
 - Additionally, the TOAF has strengthened its core competencies, positioning itself to undertake even more challenging initiatives in the future. These unexpected changes mark the Wanli Project as a major breakthrough and a transformative project for the team.
- As the sole sponsor, Hotai Motor reaped substantial benefits from this initiative. The sponsorship ignited pro-environmental practices both within and outside the company.
 - Internally, the company rallied its employees to participate in the tree-planting activity, fostering a natural evolution of pro-environmental practices within the organization.
 - Externally, the 'One Car, One Tree' campaign, now in its seventh consecutive year, continues to contribute to the corporate reputation enhancement.
- A substantial number of educational participants engaged in the tree-planting activities, and despite their diverse organizational affiliations, the transformations experienced primarily revolve around pro-environmental aspects.
 - Many developed a heightened environmental empathy and awareness. These changes manifested in various ways, such as adopting pro-environmental habits in daily life, choosing environmentally friendly products, and some even took the initiative to encourage their family members and friends to join their environmentally conscious actions.
 - But due to relatively high counterfactual and attribution ratio assigned, the resulting social value from each sub-group is relatively lower.
- A few negative outcomes were mentioned but seen as inconsequential, therefore immaterialized.

The findings of this study underscore the significant impact of TOAF's afforestation initiatives, not only in terms of environmental conservation but also in fostering broader societal benefits. By embracing the SROI analysis, TOAF has demonstrated its commitment to understanding and maximizing its positive influence on humanity and the planet.

Looking ahead, it is essential to persist in integrating the social value management system into its organization and implementing it in future initiatives as needed. This commitment will uphold their ongoing efforts towards the shared collective aim of fostering a more sustainable and harmonious world. TOAF remains dedicated to this noble cause, and we are honored to play a part in advancing their mission.

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APPENDIX

Appendix A. Sample Qualitative Interview Questions for Individuals

A. DEMOGRAPHIC INFORMATION

1. Gender
2. Year of Birth

B. CONFIRMATION OF ACTIVITY PARTICIPATION

1. Year of participation in the Wanli Project
2. How much time did you spend on the activity?
3. What specific tasks did you perform during that time?

C. INFORMATION REGARDING CHANGES

1. What [positive](#) changes have you personally experienced after participating in the tree-planting program? (Please list down one-by-one)
2. You've mentioned a couple of changes. Let's begin with the first one you mentioned (please read out).
 - What changes have you personally experienced as a result of this?
 - And then, what changes have you personally experienced as a result of this?
(Continue probing until respondents run out of answer.)
3. Regarding this change, how long after the activity did it occur?
4. How long did the change last?

【Repeat above questions for each change mentioned by respondent.】

5. What [negative](#) changes have you personally experienced after participating in the tree-planting activity? (Please list down one-by-one)

【Repeat above Q2-Q4 for each negative changes mentioned by respondents】

Appendix B. Outcome Measurements and References

I. Community Residents

1. Improved environmental comfort

Reference 1 Roskams, M. J., & Haynes, B. P. (2021). Testing the relationship between objective indoor environment quality and subjective experiences of comfort. *Building Research & Information*, 49(4), 387-398."

Scale Scale: 1=very dissatisfied, 2=dissatisfied, 3=neutral, 4=satisfied, 5=very satisfied

Measurements 1. Visual comfort
2. Air quality
3. Atmosphere

Reference 2 Cicerali, E. E., Kaya Cicerali, L., & Saldamli, A. (2017). Linking psycho-environmental comfort factors to tourist satisfaction levels: Application of a psychology theory to tourism research. *Journal of Hospitality Marketing & Management*, 26(7), 717-734.

Scale Scale: 1=very dissatisfied, 2=dissatisfied, 3=neutral, 4=satisfied, 5=very satisfied

Measurements 4. Hygiene
5. Smell

2. Increased level of physical activity

Reference Tseng, M.-Y. (2011/12). A Study of the Impact of Gender on Healthy Behavior and Health-Related Quality of Life among the Community-Dwelling Elderly in Taiwan. *Journal of Meiho University*, 31(1), 73-87.

Measurements Scale: day
1. Exercise frequency: number of days per week engaged in physical exercise before and after reforestation

Scale: less than 20 min., 20-40 min., 40-60 min., 60-80 min., 80-100 min., above 100 min.

2. Duration of physical exercise: On average length of time engaged in physical exercise each time before and after reforestation

3. Improved respiratory health

Reference	Gross, J. E., Carlos, W. G., Dela Cruz, C. S., Harber, P., & Jamil, S. (2018). Sand and dust storms: Acute exposure and threats to respiratory health. <i>American journal of respiratory and critical care medicine</i> , 198(7), P13-P14.
Scale	1=never, 2=seldom, 3=sometimes, 4=often, 5=always
Measurements	1. Eye discomfort 2. Nose discomfort 3. Throat discomfort 4. Cough and wheeze

4. Reduced frequency and time spent on cleaning house

Reference	Zock, J. P., Kogevinas, M., Sunyer, J., Almar, E., Muniozguren, N., Payo, F., ... & Spanish working group of the European Community Respiratory Health Survey. (2001). Asthma risk, cleaning activities and use of specific cleaning products among Spanish indoor cleaners. <i>Scandinavian journal of work, environment & health</i> , 76-81.
Scale	Day
Measurements	1. Frequency of vacuuming or mopping the floor per week 2. Frequency of mopping furniture per week

5. Increased sense of safety

References	Pérez-Tejera, F., Anguera, M. T., Guàrdia-Olmos, J., Dalmau-Bueno, A., & Valera, S. (2022). Examining perceived safety and park use in public open spaces: The case of Barcelona. <i>Journal of Environmental Psychology</i> , 81, 101823.
Scale	1=not at all safe, 2=somewhat unsafe, 3=feel neutral, 4=somewhat safe, 5=very safe
Measurements	1. Usually, when you are in this neighborhood, you feel... 2. Do you think that this neighborhood is... 3. In your experience, you would say this neighborhood is... 4. In relation to other areas of Wanli, you would say this neighborhood is...

5. Do you consider it likely that you may ever have a problem in this neighborhood?

6. Aroused environmental behavior intentions

Reference Pan, S. L., Chou, J., Morrison, A. M., Huang, W. S., & Lin, M. C. (2018). Will the future be greener? The environmental behavioral intentions of university tourism students. *Sustainability, 10*(3), 634.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements

1. How much do I feel about I have a responsibility to solve environmental problems?
2. How much do I feel about I have a responsibility to change my consumption habits to solve environmental problems (such as reducing shopping and purchasing energy-saving products?)
3. I am willing to adopt environmental actions in daily life to protect the environment (e.g., saving water and electricity, taking low carbon transportation producing a less detrimental effect on the environment
4. I am willing to prevent environmental problems through purchases, refusal, donations, and other consumption behaviors
5. I am willing to encourage or persuade others to adopt behaviors that prevent or solve environmental problems.

7. Took environmental protection actions

Reference 1 Karp, D. G. (1996). Values and their effect on pro-environmental behavior. *Environment and behavior, 28*(1), 111-133.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements

1. Recycled cans, bottles, or papers
2. Bought products made of recycled materials whenever possible
3. Tried to reduce the amount of plastic products bought
4. Did volunteer work for an environmental group

5. Bought organically grown produce

Reference 2 Shafiei, A., & Maleksaeidi, H. (2020). Pro-environmental behavior of university students: Application of protection motivation theory. *Global Ecology and Conservation*, 22, e00908.

Scale 1=Completely disagree, 2=Disagree, 3=No idea, 4=Agree, 5=Completely agree

Measurements 6. I try to save energy
7. I do not use disposable tableware

8. Increased sense of environmental commitment for the community

Reference Raineri, N., & Paillé, P. (2016). Linking corporate policy and supervisory support with environmental citizenship behaviors: The role of employee environmental beliefs and commitment. *Journal of Business Ethics*, 137, 129-148.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements 1. I really care about the environmental concern of my community.
2. I would feel guilty about not supporting the environmental efforts of my community.
3. The environmental concern of my community means a lot to me.
4. I feel a sense of duty to support the environmental efforts of my community.
5. I really feel as if my community's environmental problems are my own.

9. Advocated pro-environmental behavior of tree-planting

Reference Afsar, B., & Umrani, W. A. (2020). Corporate social responsibility and pro-environmental behavior at workplace: The role of moral reflectiveness, coworker advocacy, and environmental commitment. *Corporate Social Responsibility and Environmental Management*, 27(1), 109-125.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements 1. I try to convince my group members to reduce, reuse, and recycle office supplies in the workplace

2. I work with my group members to create a more environmentally friendly workplace
3. I share knowledge, information, and suggestions on workplace pollution prevention with other group members

II. Educational Participants – Subgroup 1: College Students

1. Purchased environmentally friendly products

Reference 1 Tseng, L.-C., Chang, Y.-F., & Lin, C.-C. (2010). A study of sustainable development in green consumption in Taiwan. *Journal of Innovation and Development*, 6(2), 62-76.

Scale 1=Completely disagree, 2=Disagree, 3=No idea, 4=Agree, 5=Completely agree

Measurements 1. When purchasing products, I pay attention to whether they are environmentally friendly.

 2. If a product category (such as paper) has products made from recycled materials (such as recycled paper), I would use such products.

Reference 2 Lin, P. C., & Huang, Y. H. (2012). The influence factors on choice behavior regarding green products based on the theory of consumption values. *Journal of Cleaner production*, 22(1), 11-18.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 3. I have switched products for ecological reasons when I have a choice between two equal products

 4. I purchase the one less harmful to other people and the environment.

 5. I make a special effort to buy household chemicals such as detergents and cleansing solutions that are environmentally friendly

 6. I have avoided buying a product because it had potentially harmful environmental effects

2. Took part in other environment related activities

Reference Veselinovska, S. S., & Osogovska, T. L. (2012). Engagement of students in environmental activities in school. *Procedia-Social and Behavioral Sciences*, 46, 5015-5020.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements 1. Do you take part in environmental activities organized in your school?

Reference Shih, Y.-L. (2003). Exploring the environmental activity experiences, environmental perceptions, and the development process of environmental awareness skills among elementary school students: A case study of senior grades in Taipei County and City.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements 2. I have watched or listened to programs related to environmental protection and conservation.

3. I have participated in marches or other activities advocating for environmental protection and conservation.

4. I have taken part in outdoor experiential activities or eco-tourism.

5. I have openly discussed the importance of environmental protection and conservation with others.

6. I have organized or participated in competitions both on-campus and off-campus related to environmental education or conservation themes (such as speeches, calligraphy, essays, and recycling).

3. Enhanced environmental empathy

Reference Musitu-Ferrer, D., Esteban-Ibañez, M., León-Moreno, C., & García, O. F. (2019). Is school adjustment related to environmental empathy and connectedness to nature?. *Psychosocial Intervention*, 28(2), 101-110.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

Measurements 1. I am happy when measures are taken for the protection of the natural environment.

2. I am very happy to see people who protect and care for the natural environment.

3. When a forest burns, I put myself in the place of all the living things that inhabit it.
4. When a natural landscape disappears due to the action of humans, I try to understand the reasons.
5. When the natural environment recovers after damage, I feel very happy.
6. I feel happy when I see other people enjoy the environment without harming living things.
7. When I see animals that are happy in their environment, I feel happy.

4. Increased willingness in pro-environmental behaviors

Reference Pan, S. L., Chou, J., Morrison, A. M., Huang, W. S., & Lin, M. C. (2018). Will the future be greener? The environmental behavioral intentions of university tourism students. *Sustainability*, *10*(3), 634.

Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always

- Measurements
1. How much do I feel about I have a responsibility to solve environmental problems?
 2. How much do I feel about I have a responsibility to change my consumption habits to solve environmental problems (such as reducing shopping and purchasing energy-saving products?)
 3. I am willing to adopt environmental actions in daily life to protect the environment (e.g., saving water and electricity, taking low carbon transportation producing a less detrimental effect on the environment
 4. I am willing to prevent environmental problems through purchases, refusal, donations, and other consumption behaviors
 5. I am willing to encourage or persuade others to adopt behaviors that prevent or solve environmental problems.

5. Took environment protection actions

Reference (1) Karp, D. G. (1996). Values and their effect on pro-environmental behavior. *Environment and behavior*, *28*(1), 111-133.

Scale	1=never, 2=seldom, 3=sometimes, 4=often, 5=always
Measurements	<ol style="list-style-type: none"> 1. Recycled cans, bottles, or papers 2. Bought products made of recycled materials whenever possible 3. Tried to reduce the amount of plastic products bought 4. Did volunteer work for an environmental group 5. Bought organically grown produce
Reference	(2) Shafiei, A., & Maleksaeidi, H. (2020). Pro-environmental behavior of university students: Application of protection motivation theory. <i>Global Ecology and Conservation</i> , 22, e00908.
Scale	1=Completely disagree, 2=Disagree, 3=No idea, 4=Agree, 5=Completely agree
Measurements	<ol style="list-style-type: none"> 6. I try to save energy 7. I do not use disposable tableware

6. Advocated pro-environmental behavior or tree-planting

Reference	Afsar, B., & Umrani, W. A. (2020). Corporate social responsibility and pro-environmental behavior at workplace: The role of moral reflectiveness, coworker advocacy, and environmental commitment. <i>Corporate Social Responsibility and Environmental Management</i> , 27(1), 109-125.
Scale	1=never, 2=seldom, 3=sometimes, 4=often, 5=always
Measurements	<ol style="list-style-type: none"> 1. I try to convince my group members to reduce, reuse, and recycle office supplies in the workplace 2. I work with my group members to create a more environmentally friendly workplace 3. I share knowledge, information, and suggestions on workplace pollution prevention with other group members

III. Educational Participants – Subgroup 2: Lamrim Course Attendees

1. Took environment protection actions

- Reference 1 Karp, D. G. (1996). Values and their effect on pro-environmental behavior. *Environment and behavior*, 28(1), 111-133.
- Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always
- Measurements 1. Recycled cans, bottles, or papers
2. Bought products made of recycled materials whenever possible
3. Tried to reduce the amount of plastic products bought
4. Did volunteer work for an environmental group
5. Bought organically grown produce
- Reference 2 Shafiei, A., & Maleksaeidi, H. (2020). Pro-environmental behavior of university students: Application of protection motivation theory. *Global Ecology and Conservation*, 22, e00908.
- Scale 1=Completely disagree, 2=Disagree, 3=No idea, 4=Agree, 5=Completely agree
- Measurements 6. I try to save energy
7. I do not use disposable tableware

2. Advocated pro-environmental behavior or tree-planting

- Reference Afsar, B., & Umrani, W. A. (2020). Corporate social responsibility and pro-environmental behavior at workplace: The role of moral reflectiveness, coworker advocacy, and environmental commitment. *Corporate Social Responsibility and Environmental Management*, 27(1), 109-125.
- Scale 1=never, 2=seldom, 3=sometimes, 4=often, 5=always
- Measurements 1. I try to convince my group members to reduce, reuse, and recycle office supplies in the workplace
2. I work with my group members to create a more environmentally friendly workplace
3. I share knowledge, information, and suggestions on workplace pollution prevention with other group members

3. Took part in other environment related activities

Reference	Shih, Y.-L. (2003). Exploring the environmental activity experiences, environmental perceptions, and the development process of environmental awareness skills among elementary school students: A case study of senior grades in Taipei County and City.
Scale	1=never, 2=seldom, 3=sometimes, 4=often, 5=always
Measurements	<ol style="list-style-type: none">1. I have watched or listened to programs related to environmental protection and conservation.2. I have participated in marches or other activities advocating for environmental protection and conservation.3. I have taken part in outdoor experiential activities or eco-tourism.4. I have openly discussed the importance of environmental protection and conservation with others.5. I have organized or participated in competitions both on-campus and off-campus related to environmental education or conservation themes (such as speeches, calligraphy, essays, and recycling).

IV. Educational Participants – Subgroup 3: Rotary Club-District 3481 [Organization]

1. Encouraged organization to engage in corporate social responsibility actions

Reference	Turker, D. (2009). Measuring corporate social responsibility: A scale development study. <i>Journal of business ethics</i> , 85, 411-427.
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none">1. Our organization contributes to campaigns and projects that promote the well-being of the society.2. Our organization implements special programs to minimize its negative impact on the natural environment.3. Our organization participates in activities which aim to protect and improve the quality of the natural environment.

4. Our organization encourages its employees to participate in voluntarily activities.

2. Facilitated and expanded scope of networking for organization

Reference Thornton, S. C., Henneberg, S. C., & Naudé, P. (2014). Conceptualizing and validating organizational networking as a second-order formative construct. *Industrial Marketing Management*, 43(6), 951-966.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements

1. We proactively take part in various trade events.
2. We proactively interact with trade associations, trade committees or regulatory bodies.
3. We ask our business partners to refer/guide us to the right person(s)/organization(s) that can help our business grow.
4. By actively being involved in the industry-specific trade organizations (e.g. committees and associations), we can put our weight on shaping the development of our industry.
5. We make every effort to go out and network in order to increase our reputation in the market.
6. We recognize that the value of working well with our business partners adds to the reputation of our products or services.

V. Hotai Motor [Organization]

1. Facilitated corporate's pro-environmental practices

Reference Rusinko, C. (2007). Green manufacturing: an evaluation of environmentally sustainable manufacturing practices and their impact on competitive outcomes. *IEEE transactions on engineering management*, 54(3), 445-454.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements

1. Reducing energy use
2. Reduce solid waste

3. Reduce emissions
4. Recycle solid waste
5. Use renewable materials
6. Use renewable materials Use eco-friendly energy
7. Train employees on sustainability
8. Sustainable education and outreach
9. Encourage suppliers to use sustainable practices

2. Enhanced corporate reputation

Reference 1 Gürlek, M., Düzgün, E., & Uygur, S. M. (2017). How does corporate social responsibility create customer loyalty? The role of corporate image. *Social Responsibility Journal*, 13(3), 409-427.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 1. General public have always had a good impression of this company
 2. In my opinion, this company has a good image in the minds of consumers
 3. I believe that this company has a better image than its competitors

Reference 2 Özcan, F., & Elçi, M. (2020). Employees' perception of CSR affecting employer brand, brand image, and corporate reputation. *SAGE open*, 10(4), 2158244020972372.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements This enterprise has better environmental responsibility than its competitors.

3. Enhanced employee engagement

Reference Lee, D. C., Hung, L. M., & Chen, M. L. (2012). Empirical study on the influence among corporate sponsorship, organizational commitment, organizational cohesiveness and turnover intention. *J. Mgmt. & Sustainability*, 2, 43.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 1. My employees enjoy participating in organizational and group activities.

2. My employees are very pleased with the time spent on team activities hosted by my organization.
3. My employees recognized the way we handle tasks.
4. I think my work group is a meaningful team.

4. Enhanced dealer engagement

Reference	Anisimova, T., & Mavondo, F. (2014). Aligning company and dealer perspectives in corporate branding: implications for dealer satisfaction and commitment. <i>Journal of Business-to-Business Marketing</i> , 21(1), 35-56.
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. Our dealers really cares about the future of our company 2. Our dealers intend to maintain a productive relationship with us 3. Our dealers will continue dealing with us even if other car manufacturers offer them what appears to be a better deal 4. Our dealers look forward to doing more business with us in coming years 5. Our dealers may consider opening another dealership '

VI. Project Executors: TOAF

1. Enhanced team's competencies and effectiveness

Reference 1	Zwikael, O., & Gonen, A. (2007). Project execution game (PEG): training towards managing unexpected events. <i>Journal of European Industrial Training</i> , 31(6), 495-512.
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. The reforestation initiative contribute to our team's risk management knowledge. 2. The reforestation initiative contribute to our team's project management knowledge.

3. The reforestation initiative improve our team’s capability to cope with risk event.

Reference 2 Ngereja, B., Hussein, B., & Andersen, B. (2020). Does project-based learning (PBL) promote student learning? a performance evaluation. *Education Sciences*, 10(11), 330.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 4. Our team will be able to manage projects better in the future because of the experiences we gained from working on the reforestation initiative.

5. I evaluate my team efforts as outstanding (i.e., collaboration, communication, and knowledge sharing within the team).

2. Enhanced team resilience

Reference Varajão, J., Fernandes, G., Amaral, A., & Gonçalves, A. M. (2021). Team resilience model: An empirical examination of information systems projects. *Reliability Engineering & System Safety*, 206, 107303.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 1. Collaboration among project team members.

2. Individual resilience of project team members.

3. Ability of project team members to learn from mistakes.

4. Assertiveness among team members (e.g., “talk about what should be spoken”)

5. Active listening of all project team members.

6. Project team members to recognize their weaknesses and mistakes.

VII. Project Executors: Zen Zhou Co.

1. Enhanced team’s core competencies

Reference	Hogan, S. J., Soutar, G. N., McColl-Kennedy, J. R., & Sweeney, J. C. (2011). Reconceptualizing professional service firm innovation capability: Scale development. <i>Industrial marketing management</i> , 40(8), 1264-1273.
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. Provide innovative ideas and solutions to clients 2. Be open to unconventional ideas 3. Provide our clients with services/products that offer unique benefits superior to those of competitors 4. Implement new ideas within the firm 5. Develop new processes to deliver our services/products 6. Develop new products that enhance our service to clients

2. Gained organization resources

Measurements	<p>Taking the year before the tree-planting activity as the baseline year...,</p> <ol style="list-style-type: none"> 1. How much extra funding have you obtained in the year following the tree-planting activity as a result of it? This includes extra business income, project income, subsidies, etc.) 2. how much extra media exposure have your organization earned in the year following the tree-planting activity as a result of it? Please specify number of... <ol style="list-style-type: none"> a. TV news report b. Print (magazine and newspaper) report c. Web news report d. Facebook fans e. Instagram fans
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VIII. Project Executors: TOAF Afforestation Team Members

1. Had a sense of self-worth

Reference	Tang, T. L. P., & Weatherford, E. J. (1998). Perception of enhancing self-worth through service: The development of a service ethic scale. <i>The Journal of social psychology</i> , 138(6), 734-743.
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. Service to others gives me an opportunity to give help to other people 2. Service to others is honourable 3. Service to others gives me a feeling of worthwhile accomplishment 4. Service to others gives me a feeling of self-fulfilment 5. Service to others provides an opportunity for personal growth and development 6. Service to others makes me feel that I am an important part of the community

2. Improved communication skills

Reference	Takahashi, M., Tanaka, K., & Miyaoka, H. (2006). Reliability and validity of communication skills questionnaire (CSQ). <i>Psychiatry and Clinical Neurosciences</i> , 60(2), 211-218
Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. Choosing suitable sentences 2. Finding communication tips while conversing 3. Speaking about own opinion or situation 4. Expressing positive feelings to other people 5. Asking someone for something 6. Joining other people's conversation

3. Enhanced social contribution

Reference	Keyes, C. L. M. (1998). Social well-being. <i>Social psychology quarterly</i> , 121-140.
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Scale	1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree
Measurements	<ol style="list-style-type: none"> 1. Your behavior has some impact on other people in your community. 2. You think you have something valuable to give to the world. 3. You don't have the time or energy to give anything to your community. 4. You think that your work provides an important product for society.

4. Increased sense of environmental commitment for the community

Reference	Raineri, N., & Paillé, P. (2016). Linking corporate policy and supervisory support with environmental citizenship behaviors: The role of employee environmental beliefs and commitment. <i>Journal of Business Ethics</i> , 137, 129-148.
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Scale	1=never, 2=seldom, 3=sometimes, 4=often, 5=always
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Measurements	<ol style="list-style-type: none"> 1. I really care about the environmental concern of my community. 2. I would feel guilty about not supporting the environmental efforts of my community. 3. The environmental concern of my community means a lot to me. 4. I feel a sense of duty to support the environmental efforts of my community. 5. I really feel as if my community's environmental problems are my own.
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5. Enhanced sense of achievement

Reference 1	Plagnol, A. C., & Huppert, F. A. (2010). Happy to help? Exploring the factors associated with variations in rates of volunteering across Europe. <i>Social indicators research</i> , 97, 157-176.
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Scale	1=Completely disagree, 2=Disagree, 3=No idea, 4=Agree, 5=Completely agree
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Measurements	<ol style="list-style-type: none"> 1. Most days I feel a sense of accomplishment from what I do. 2. I generally feel that what I do in my life is valuable and worthwhile.
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Reference 2 Ferreira, M. R., Proença, T., & Proença, J. F. (2012). Motivation among hospital volunteers: an empirical analysis in Portugal. *International Review on Public and Nonprofit Marketing*, 9, 137-152.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 3. Volunteering makes me feel needed.
4. Volunteering makes me feel better about myself.
5. Volunteering increases my self-esteem.
6. I feel it is important to help others.

6. Deteriorated physical conditions

Reference Hudak, P. L., Amadio, P. C., Bombardier, C., Beaton, D., Cole, D., Davis, A., ... & Wright, J. (1996). Development of an upper extremity outcome measure: the DASH (disabilities of the arm, shoulder, and head). *American journal of industrial medicine*, 29(6), 602-608.

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 1. Doing your usual work because of arm, shoulder or hand pain?
2. Doing your work as well as you would like?
3. Spending your usual amount of time doing your work?

7. Improved stamina

Reference Abadie, B. R. (1988). Construction and validation of a perceived physical fitness scale. *Perceptual and Motor skills*, 67(3), 887-892

Scale 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree

Measurements 1. The feeling that climate change is too big for my actions to have an impact.
2. The feeling that my actions will not affect the outcome of climate change.
3. The feeling that my contribution is just a drop in the ocean and so is insignificant.

3. Gained organization resources

- Measurements Taking the year before the tree-planting activity as the baseline year...,
1. How much extra funding have you obtained in the year following the tree-planting activity as a result of it? This includes extra business income, project income, subsidies, etc.)
 2. how much extra media exposure have your organization earned in the year following the tree-planting activity as a result of it? Please specify number of...
 - a. TV news report
 - b. Print (magazine and newspaper) report
 - c. Web news report
 - d. Facebook fans

4. Gained new partners

- Measurements Taking the year before the tree-planting activity as the baseline year...,
1. How many additional official partners has your organization gained within one year after the activity as a result of it?
 2. How many additional academic partners has your organization gained within one year after the activity as a result of it?

Appendix C. Quantitative Questionnaire Template

I. Personal Information

1. Gender
2. Year of Birth
3. Email
4. Name of the organization you are affiliated with when participating in tree-planting activity

II. Impact Understanding

1. Have you personally experienced any positive or negative changes as a result of participating in the tree-planting activity?
 - If yes, proceed to 2.
 - If no, skip to IV 'Recommendation' section.
2. Participating in the tree-planting activity may have led to positive or negative changes for attendees. Please select from the list below the changes you have experienced.
3. For each outcome change checked, ask below sets of questions:
 - 1) Before/After participating in the tree-planting activity, what's your assessment towards [Outcome measurement question]?
 - 2) If this [Outcome change] were a product available in the market, how much would you be willing to pay to acquire it?
 - Please provide a brief rationale behind your estimation.
 - 3) How important is this [Outcome change] to you? (Scale 1-10)
 - 4) Please estimate the likelihood that the [Outcome change] would have occurred regardless of participating in the tree-planting activity. (Scale 0%-100%)
 - Please provide a brief rationale behind your estimation.
 - 5) Please estimate how much of the [Outcome change] you've experienced is likely attributed to other activities. (Scale 0%-100%)
 - Please provide a brief rationale behind your estimation.
 - 6) Please estimate the likelihood that the [Outcome change] has caused a reduction or displacement in outcomes for other stakeholder groups as a result of participating in the tree-planting activity. (Scale 0%-100%)
 - Please provide a brief rationale behind your estimation.
 - 7) Please estimate, for approximately how many years will the [Outcome change] you've experienced likely persist? (Year 1-6)
 - 8) If above answer is over one year, please estimate what's the annual rate of decline for the [Outcome change] you've experienced?
 - Please provide a brief rationale behind your estimation.
 - 9) Would the [Outcome change] you've experienced lead to a decrease in the [change] of others?
 - If so, please estimate the extent to which others would experience this decrease. (Scale 0%-100%)
 - Please provide a brief rationale behind your estimation.

III. Final check

1. Besides from aforementioned changes, what other positive changes you have experienced?
2. Besides from aforementioned changes, what other negative changes you have experienced?

IV. Recommendations

1. Do you have any recommendations for TOAF Afforestation team?
2. Do you have any recommendations for this survey?

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Note 1: To understand the outcome measurement questions used in the template above, please see **Appendix B** for the references related to the outcome indicators and scales.

Note 2: The above template is designed for individual stakeholder groups. For organizational stakeholder groups, the questions are similar, except for Part I, where "Personal Information" is replaced with "Organizational Information."