



The Relevance of Technology Use in Challenging the Tourism Villages Sustainability According to the Triple-Bottom-Line Criticism

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ABSTRACT

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Learning from past failures in establishing a Triple-Bottom-Line (TBL) approach involves understanding its criticisms and recognizing where it falls short as a performance measure. Despite its widespread use, several criticisms highlight the limitations of the TBL as an indicator. Unfortunately, evaluating progress made by village-based tourism policy is only possible with clear metrics. Due to the difficulty in evaluating progress, there must be an excellent framework, especially when aligning with multiple Sustainable Development Goals (SDGs). This research uses a logic model to measure the performance of village-based tourism practices in Indonesia. A logic model is essential to define more precise, consistent, and standardized metrics to address the criticisms regarding unclear measurements. It generally examines how a logic model examines TBL using digital platforms or technological intervention instruments for more precise metrics. The mission clarifies how to measure economic, socio-cultural, and environmental performance in response to SDGs concepts. This case study is drawn exclusively from villages-based tourism: Tugu Utara, Saung Sarongge, and Pusat Laut. The essential results reveal that a logic model builds an understanding of technology use's evidence when proposing indicators of performance measures: digital integration of micro-institutions in economic, technology diffusion in socio-cultural, and technology adoption in the environment.

1. INTRODUCTION

In 2009, Indonesia's Ministry of Tourism and Creative Economy initiated a focus on village-based tourism policy for the first time as a significant driver for promoting sustainable tourism aligned with multiple United Nations Sustainable Development Goals (SDGs) [1]. With time limits remaining 15 years after that policy, how could this performance of sustainable village-based tourism practices be measured? Have village-based tourism strategies been aligned directly with specific SDG targets? Does it contribute to measurable global goals yet by 2030? A comprehensive indicator framework directly aligns with relevant SDGs. The framework should include specific, measurable, achievable, relevant, and time-bound indicators for each dimension of sustainability [2]. Based on previous literature, a Triple-Bottom-Line (TBL) measures village-based tourism's overall sustainability performance, combining economic gains, social benefits, and

environmental impacts [3]. Critical considerations highlight that TBL also had some problems, which we will discuss. Unlike financial performance, which has clear and universally accepted accounting standards, social and environmental metrics can be vague, subjective, or inconsistent [4]. Addressing these root causes involves developing effective performance measures, establishing clear, realistic goals, implementing strong management practices, and ensuring alignment and collaboration among all participants in village-based tourism initiatives. Some criticism of TBL occurs because of its impracticality [5], difficulty in performance measurement [2] and contradictions between one element and another [6]. In its policy implementation, the reality of the tourism practices is more challenging than the planning concept [7].

Based on previous research, tourism villages are said to be sustainable if they can meet the requirements of 3 (three) aspects of sustainability, namely: economic, socio-cultural,

and environmental [8]. Having the necessary causes for successful integration among this interdependent area [9], it should incorporate the economic, socio-cultural, and environmental sectors by creating digital platforms/technology interventions. The previous study examines the concept of digitalization, which refers to the utilization of diverse digital platforms and technical interventions in tourism villages [10]. Technology interventions is response to existing demands, such as communication tools using WhatsApp and Telegram; popular social media platforms including Instagram, Facebook, YouTube, Twitter, and TikTok; payment applications using DANA, QRIS, OVO, mobile banking; and other complex technology or soft technology for drones, security systems, water treatment systems, and waste treatment systems. This research is considering engaging several digital platforms/technology interventions to meet clear and universal metrics needs so that SDG targets can be measured. Therefore, examining how technological interventions can encourage sustainable tourism villages regarding economic [11], socio-cultural [12], and environmental [13] performance measures requires widely recognized frameworks like a logic model approach. The benefit of a logic model is that it tracks and coordinates the contributions of multiple participants, provides good alignment towards performance plans, effectively manages strategic plans, and has a strong linkage between the successful implementation of strategic goals [14].

Therefore, this research collaborates with research from the Badan Penelitian dan Pengembangan Daerah/BP2D team of West Java Province to overcome these clear and consistent metrics by developing a logical model approach for challenging performance measurement in economic, socio-cultural, and environmental. So, the research question is how to play an integral role of technology intervention in a logic model as the best way to specify village tourism practices' performance measures to gain SDGs by 2030.

2. MATERIALS AND METHODS

2.1 Location and time of research

The study was done from August to September 2023. The

data collection for this study involved the use of purposive and accidental sampling techniques in two tourism villages situated on Java Island: Tugu Utara Tourism Village in Bogor Regency and Saung Sarongge Tourism Village in Cianjur Regency, both located in the West Java Province. Located in the Donggala Regency of the Central Sulawesi Province is the Pusat Laut Tourism Village-Towale, just outside of Java Island.

2.2 Research procedures

The data collection procedure encompassed in-depth interviews and questionnaires purposefully designed to acquire knowledge about the study objectives or the subject under investigation. The questionnaire works as a tool to set up the interview, analyze further relevant subjects, and adapt additional questions according to the respondent's clarification in a flexible way. Following the conclusion of the interviews, an additional step involves the transcription and compilation of the gathered data in preparation for analysis. The process of analysis can involve the identification of recurring themes, motifs, or recent developments within the collected responses, as well as an exploration of any variations or divergent viewpoints offered by those who answered the questions. The abovementioned technique provides findings and insights that effectively comply with the research objectives by analyzing the information acquired. Within Table 1, let us explain how research methods apply to each economic, socio-cultural, and environmental purpose.

2.3 Data analysis

Within a logic model as seen in Figure 1, let us explore how data analysis applies to each economic, socio-cultural, and environmental purpose. A logic model refers to a logical chain of events, providing a blueprint for mission achievement. It is a graphic representation that illustrates the rationale behind a program or management. Moreover, Figure 2 depicts causal relationships between activities, strategies, and results. Figure 3 contains goals and performance measures and integrates various program activities into a cohesive whole.

Table 1. Research methods

No.	Purpose	Research Methods
1	Economic performance measure	Participatory observation: It involved actively participating researchers to gain a better understanding of the role and activities of micro-enterprises/local communities in tourism development [15]. This methodology has the potential to uncover issues and obstacles that may remain unnoticed when employing alternative research approaches. Survey and interview with questionnaire guide: Identify the type of technology adoption used, the benefits and challenges of technology adoption, and factors influencing technology adoption in tourism. Focus group discussion: Collect qualitative data from local communities, visitors, and other stakeholders to explore their perceptions of socio-cultural dynamics and strengthen the role of micro-enterprises in tourism development.
2	Socio-cultural performance measure	Capacity building: This investigation aims to assess the viability and efficacy of technology interventions in tourist development through questionnaires before and after training.
3	Environmental performance measure	Triangulation method: Participatory observation Surveys and interviews with questionnaire guides Focus Group Discussion

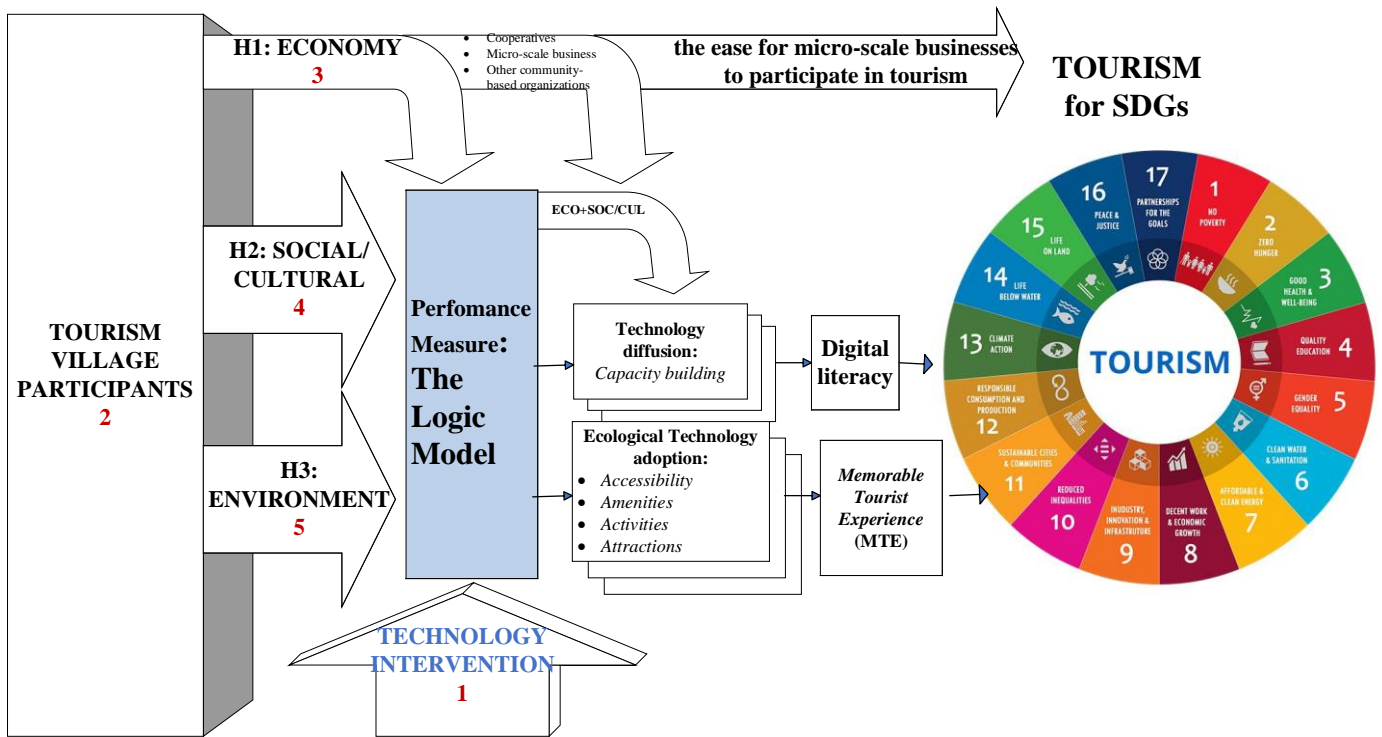


Figure 1. The theoretical framework of research model

Notes: 1. (a) The promotion incorporates many communication applications such as WhatsApp, Telegram, and others, as well as popular social media platforms, including Instagram, Facebook, YouTube, Twitter, and TikTok; (b) Transactions are executed by several payment applications, such as DANA, QRIS, OVO, and mobile banking for transfers, among others; (c) Managerial filled with bookkeeping applications; 2. Consist of 3 (three) main participants: (a) tourism village management; (b) micro-scale business actors, cooperatives, and BUMDes (Village-Owned Enterprises) situated close to the tourism villages; (c) the visitors; 3. To identify and analyze the potential integration between micro-institutions; 4. To carry out capacity building on digital platforms as part of the research stage for technology diffusion analysis; 5. To assess the degree to which the management of tourism villages can adopt environmental technologies.

Logic modeling is based on mapping and defining linkages between what we do and why we do it (Figure 4). Most logic models incorporate the following elements. A logic model is a vehicle for dialogue, planning, program management, and evaluation. A plan offers a framework for comprehending the circumstances that necessitate an initiative, the envisioned end state, and how investments are connected to activities aimed at specific individuals to attain the intended results. Manage displays the connections between resources, activities, and outcomes; explains, tracks, and monitors operations, processes, and functions [16]. An evaluation determines when and what to evaluate for effective and efficient evaluation and focuses evaluation on appropriate process and outcome measures. Communication provides a simple, clear graphic representation of a program or initiative for village-based tourism participants.

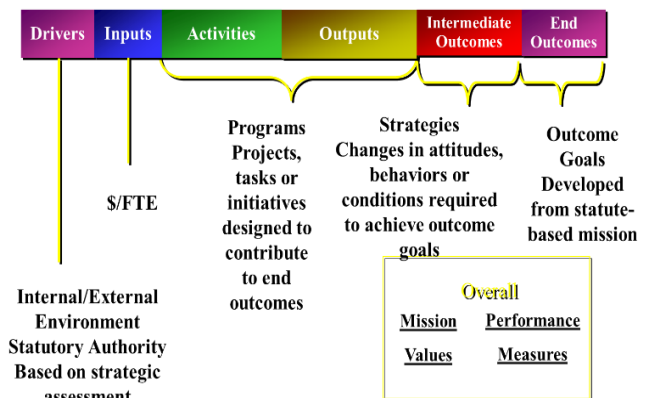


Figure 3. Relating logic models to strategic plan elements
Source: [17]

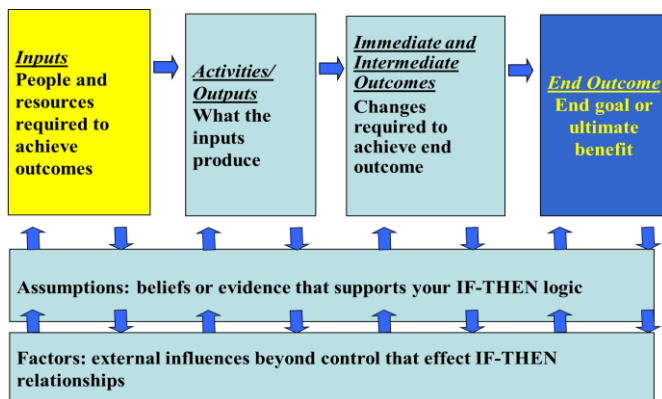


Figure 2. Series of if-then relationships
Source: [17]

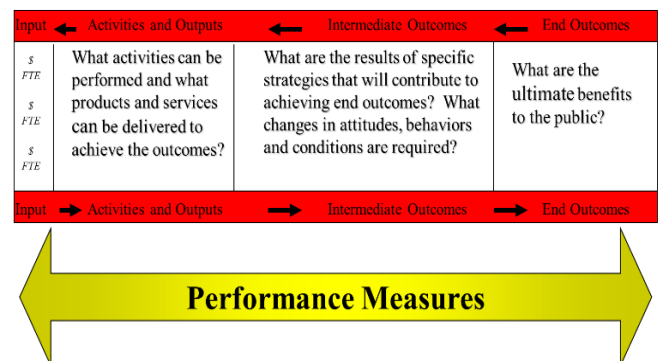


Figure 4. Introducing the performance logic model

3. RESULTS

3.1 Tugu Utara tourism village in Bogor Regency of the West Java Province

3.1.1 Economic assessment

Tourism village managements who formed the Tugu Utara Community Alliance (Amarta) and made Talaga Saat the main icon have collaborated and partnered with village-owned enterprises (BUMdes) and private parties. BUMdes made capital participation by providing several rides in tourist villages. The rides/tour packages offered are increasing, such as suspension bridges, canoe boats, glamping, hiking to the waterfall, and tea-making education. Along with the development of tour packages offered, diversification of alternative livelihoods is increasing, including ticket post guards, stalls, ride operators, tour guides, photographers, employees in management units, cleaning, and information technology. In the beginning, the participation of the surrounding community as micro-scale business actors was an alternative livelihood [18]. However, over time, it turned into a reliable livelihood.

Mostly, digital payment applications have also begun to be used by micro businesses around tourist sites. The payment application for the trading unit is the QRIS application, while the payment application used for the tourism service unit is the Dana application. However, most transactions still use cash because it is possible to have blank spot signals from several providers at specific points of tourist destination locations.

Additionally, a tourism village cooperative provides tourism services. In addition to focusing on managing tourism services, in the future, the cooperative, which has around 60 members, will expand its business unit through the provision of merchandise for micro, small, and medium enterprises (MSMEs) both in tourist destination locations and around the Tugu Utara Village area. In the forthcoming period, there will be an establishment of a business division aimed at facilitating the supply of fertilizer to coffee farming collectives. The main thrust of this effort is to maintain the ongoing production of Padjajaran coffee, a well-known commodity in the Tugu Utara region, while also ensuring that it effectively meets the demands of customers.

3.1.2 Social-cultural assessment

The level of digital literacy at the site level is evidence of support from local residents/villagers, including the use of digital platforms in communicating with the WhatsApp application. At the same time, promotional media uses Instagram, Facebook, Twitter, and YouTube applications. A comprehensive understanding of trends, patterns, opportunities, and risks of technology utilization is a tool to measure the extent of the technology diffusion process in the development of the tourism village. Currently, what is being pursued by the tourism village manager is the promotion of travel packages. The percentage of profit sharing is still a consideration in participation decisions. The main obstacle to the promotion of tour packages using travel portal platforms is hacking and piracy by hackers. Tourism village managers also have a website, although sometimes it is still constrained by downtime.

3.1.3 Environmental assessment

The challenge for tourism village management is to prioritize the satisfaction and authentic and memorable

experiences or Memorable Tourists Experience (MTE) [19] while paying attention to the carrying capacity of the environment as a tourist destination located in the upstream Ciliwung Watershed (DAS). It is also a conservation area, so it needs ongoing preservation and protection. It is imperative to strike a harmonious equilibrium between the allure of ecotourism and the area's carrying capacity. Thus, tourism village management limits workday visitors to 300 and holiday visitors to 500. Consider using geographic information systems (GIS) to record conservation area data such as lake boundaries, vegetation kinds, and topography. Maps and plans are more accurate with GIS.

In addition, there is a cleaning unit whose duty is to clean up visitors' garbage to the tourism village. Tugu Utara Village has set up 2 (two) integrated trash processing sites (TPST) to receive their share of the village's inorganic garbage. In contrast, The Bogor Regency Cleanliness and Plants Office (DKP) distributes unaccommodated waste. Interestingly, commercial entities near vacation areas are exploring the potential use of their organic waste. There has been a proposal to introduce the practice of feeding this waste material to maggots and subsequently utilizing it for composting purposes. There is a great deal of hope for the potential of leveraging advanced technology in the organic waste processing industry to facilitate the production of fertilizer for coffee crops by farmer collectives in the coming years.

3.2 Saung Sarongge tourism village in Cianjur Regency of the West Java Province

3.2.1 Economic assessment

The existence of Saung Sarongge began with the forest reforestation program of Gunung Gede National Park, which changed its function to vegetable crops. In 2008, a journalist, a nature devotee, and Green Radio collaborated to establish a tree adoption program to restore the ecological functionality of the affected forest. The number of visitors, both from within and outside the country, who visit and are involved in this tree adoption program is used as an opportunity by residents to create a kind of residence (Camping Ground, Saung Sarongge, homestay) for visitors known as Saung Sarongge by offering the charm of rural nature. In addition, it maps the relationship/interaction between tourism village managers and micro-scale business actors around tourism village who pioneered Sarongge ecotourism, including sheep, rabbits, organic vegetables, and cottage industries such as soap-making lemongrass oil. In addition, there is a need to regenerate the management and profession of farmers as business participants. Today, many young people are more interested in working as factory employees rather than being farmers.

3.2.2 Social-cultural assessment

The utilization of digital platforms by BUMDes management is through financial and administrative applications. In addition, marketing tourism potential, agricultural products, and arts in tourism villages is through the website. A lack of managerial resources, especially regarding knowledge, has slowed down efforts to promote tourism [20]. It can be seen in search of the website only the choice of Camping Ground Sarongge and Canyoneering. If we look at the existing potential, such as the Sarongge cultural festival (*ngaruwat cai*), this can be a unique attraction to increase tourist visits. Although the character is still needed, it

is also necessary to carry out various training/knowledge transfers to the next generation to preserve culture and the environment following the latest scientific developments.

The media used for product promotion and travel is still limited to Instagram and WhatsApp (through status updates). Some visitors have indirectly promoted this tourist village through YouTube shows and popular media. If see the existing potential, promotional efforts through digital platforms in Sarongge can partner with private parties, PPTK (Tea and Quinine Research Center), Gamboeng, Cooperatives, and BUMDes around the area. For promoting some agricultural products sold by BUMDes, they are already using an e-commerce platform (Tokopedia).

The Gunung Gede Pangrango National Park (TNGGP) serves as the primary area within the Cibodas Biosphere Reserve (CBC), with Sarongge Village acting as its adjacent buffer zone. CBC is one of 19 biosphere reserves in Indonesia and was designated in 1977 by UNESCO. Starting from the concept of area management that integrates the protection function and the cultivation function, Sarongge Village pioneered a tree adoption program. This program is in the form of farmers planting endemic trees in areas to be forested, with donations from tree adopters. The monetary value assigned to each tree contribution is IDR 108,000. Adopters can grow their own or be delegated to farmers to be planted and cared for three years. GPS marks the plants so adopters can visit to see the progress of the results. The hope is that farmers can go down the mountain with better rewards/income as an attraction to want to go down and regreen the forest. Over time, this tree adoption program has been very successful. It has attracted the interest of many adopters, including national figures and artists, and support from well-known companies such as Astra International, Bodyshop, Four Seasons Hotel, Toshiba, and Unilever. This activity also received direct support from the number 1 person in Indonesia at that time, President Susilo Bambang Yudhoyono visited and carried out tree adoption activities.

3.2.3 Environmental assessment

Additionally, they may get knowledge about organic farming practices, as well as gain insights into sheep and rabbit husbandry. Visitors can participate in workshops focused on cottage industry products, such as soap making and the production of citronella oil. Think about the potential of cutting-edge tools like Augmented Reality (AR) to create engaging and informative environments for learners. For example, visitors can use AR to display additional information when pointing their smartphone camera at a specific object. Virtual Reality (VR) or in the form of a relevant environmental tour and exciting education to describe the natural beauty, history, and culture of the village. In addition, business products in Sarongge Village have begun to receive certificates/branding from CBC as environmentally friendly products, namely organic vegetables (Independent Farmer Group) and betel soap home industry. For agricultural products, especially vegetables, a small number have applied the concept of organic plants, but almost 90% still use pesticides (Chemistry). So, this needs to get its attention from the government because it will impact the environment [21]. Consider using modern technology such as Integrated Pest Management (IPM). The use of chemical pesticides is only as a last resort.

3.3 Pusat Laut tourism village-Towale in Donggala Regency of the Central Sulawesi Province

3.3.1 Economic assessment

At first, the leading icons of the featured tourist attraction were the attraction of chasing coins thrown by tourists into a giant well and then grabbed by children who swam and dived in the well; the traditional ceremony of Nodiu Bulava Mpongeo which is a cultural tradition of customs that becomes one held every year to coincide with the Islamic New Year; and Underwater Enchantment of Pasi Bai Atoll, Towale Village. Then, the involvement of key actors, namely micro-scale entrepreneurs/woven sarong artisans Buya Sabe has played a role as one of the pillars of sustainability in the development of tourism villages.

Nearly every woman in the village is skilled in weaving sarongs. As a result, the town was awarded the title of "Tourism Village with the Most Weaving Artisan" by the Museum Rekor-Dunia Indonesia (MURI) in 2023. There are two major groups of weavers to choose from while looking at the artisans. The first group consists of artisans who possess the status of being assisted by BUMDes (Village-Owned Enterprises) and are highly skilled in the art of weaving using Non-Machine Weaving Equipment (ATBM). The usual name for this particular group is the Yamamore'e Weaving Research Group. The second group comprises self-sufficient artisans weaving using traditional gedogan tools within the confines of their residential gazebos. Yamamore'e Weaving Study Group is overwhelmed by orders from its partner (Bank Indonesia), while independent artisans have yet to develop their businesses due to capital constraints. Many independent artisans had joined the Yamamore'e Weaving Study Group. However, there were concerns about the need for more flexibility for artisans, particularly women, who were expected to fulfill household chores, regarding the centralized and relatively permanent ATBM facility on the second floor of the Village Head's Office. Some members of the Yamamore'e Weaving Study Group are more interested in returning to manual looms because they have WFH (Work-from-home) flexibility or flexibility in working hours even though access to capital is not as accessible as before. For the sustainability of the achievements of Towale Tourism Village, which won second place in the Souvenir (weaving) category in the 2023 Tourism Village Award (ADWI) assessment organized by the Ministry of Tourism and Creative Economy, it would be nice if it was followed up with the Craftsman Cooperative institution to facilitate access to woven sarong capital as needed.

3.3.2 Social-cultural assessment

The use of digital platforms to meet promotional needs [22], namely through communication applications and social media (Instagram and YouTube), has been carried out. However, using digital platforms to meet transaction and managerial needs is still constrained by infrastructure and networks. Visitors must adapt to the weakness of the signal and the location of the ATM, which is far from the tourism village. The biggest challenge for local governments and tourism village management with various infrastructure and network constraints is to optimize the attractiveness/uniqueness that other tourist destinations still need to have [23].

3.3.3 Environmental assessment

Although lost: 1) Accessibility (ease of access to and within tourist villages) and 2) Amenities (infrastructure and supporting facilities). It turns out to leverage 1) Activities (possibilities for action there) and 2) Attractions (attractions in Tourism Villages, for example, natural beauty, cultural heritage [24], traditional arts, local crafts) through technological interventions have the potential to be carried out by the Donggala Regency Government and the management of the Pusat Laut-Towale Tourism Village. It is necessary to lead this phase through 1) marketplace as a diffusion of technology so that woven sarong artisans avoid the practice of "ijon" and 2) procurement of woven glove barcodes that can raise historical value/will store data/storytelling about the process of craftsmanship and local wisdom in it; 3) the implementation of a virtual tour, a fee-based interactive program, has been proposed as an innovative strategy to enhance Regional Original Income (ROI) by providing visually immersive experiences in various tourist sites.

Virtual tours allow for those who do not come directly to the Pusat Laut Tourism Village, Towale, but want to enjoy the unique attractions offered, such as coin throwing attractions at the natural old well of the sea center (pusentasi), snorkeling underwater beauty at Karampuana Beach, historical relics of Bulava Mpongeo, and also details of the process of making woven sarongs of artisans in tourism village.

Some options for technology adoption by the managers of the Laut-Towale Center Tourism Village located in the seaside area include meeting clean water quality standards. In addition to efforts to improve water transportation from more abundant water sources, it is necessary to consider a feasibility study of treating salt or brackish water into fresh water with a Reverse Osmosis (RO) system or a rainwater storage system with environmental experts/academics/assistants/facilitators [25]. Currently, One Village One Lecturer (OVOL) has been created with Tadulako University's Research and Service Institute to obtain more specialized advice based on the characteristics of the tourism village.

4. DISCUSSION

4.1 Economic performance measure

It is helpful to relate logic models to economic performance measure elements (Figure 5). It starts with work activities and cascades down toward intermediate outcomes. Sometimes, people define their activities as outputs. The best way to deal with activities is to lump them into the specific output they serve. This activity aids in the clarification of the distinction between activities and outputs. Again, the purpose of measuring the performance of sustainable village tourism practices is to ensure SDGs attainment by 2030 by building the technology intervention for promotion, transaction, and bookkeeping so that village tourism participants can obtain integration between micro-scale business participants.

Here are the questions to consider during the stage in the process where we specify intermediate outcomes. What must change in the current situation to create the conditions necessary for SDGs attainment? Who are the targets of change, and what must they do? These deal with the necessary attitudinal and behavioral changes. What are the current barriers to the fulfillment of these end goals? What causes these outcomes to fail to be achieved? Intermediate outcomes

are synonymous with strategies. Explore the definition of strategy in more detail since it is essential to what ABC (attitude, behavior, and condition) is.

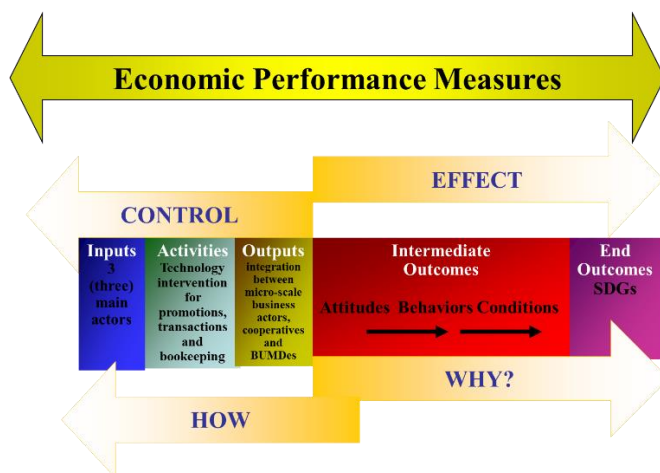


Figure 5. Mapping logic model for economic performance

Tourism villages on Java Island are beneficial since they encourage local entrepreneurs to set up businesses and provide their wares to tourists [26]. Specifically, this convenience is evident in Tugu Utara Tourism Village in Bogor Regency and Saung Sarongge Tourism Village in Cianjur Regency, located in the West Java Province. The presence of two research locations signifies the potential for effectively integrating products and services in tourism villages [27]. Managers of tourism villages can better integrate with the digital world by using these tools to advertise their businesses, accept payments, and plan for subsequent occurrences. The primary market category of the tourism village visitors in both locations consists mainly of those who possess substantial spending power or individuals originating from regions with a high Regional Original Income (ROI). Travelers to these two destinations typically have high regard for the services provided by tourism villages. The Pusat Laut Tourism Village-Towale in the Donggala Regency of Central Sulawesi has a distinct vibe from this. Apart from being surrounded by areas with ROI that are not too high, and the ability/purchasing power of tourism needs is still relatively low, it turns out that the ability to bring as many direct physical visits as visitors to the Pusat Laut-Towale Tourism Village is still a significant obstacle. Because amenities and accessibility are substantially inferior to those in other fields, one potential strategy for enhancing earning potential through integrating Pusat Laut Tourism Village-Towale's management with micro-scale businesses is to highlight an assortment of outstanding goods and services that offer uniqueness and attractiveness. This leverage can be in the form of local crafts by micro-scale businesses, namely woven sarong fabric artisans who are currently overwhelmed to fulfill orders. Hence, the economic significance of technology involvement is perceived to surpass that of digital platforms utilized for promotional activities, payment transactions, and bookkeeping requirements. For example, weaving artisans, who are currently the main pillars of the Pusat Laut-Towale Tourism Village, are more in need of cooperative institutional development, marketplaces, barcodes, and virtual tours.

Economically, the attitudes of Tugu Utara Tourism Village and Saung Sarongge Tourism Village are better integrated with the digital world by using these tools to advertise their

businesses, accept payments, and plan for subsequent occurrences rather than Pusat Laut Tourism Village. Tugu Utara Tourism Village and Saung Sarongge Tourism Village signify the potential for effectively integrating products and services. In contrast, the conditions of Pusat Laut-Towale Tourism Village need more cooperative institutional development, marketplaces, barcodes, and virtual tours. The behaviors of the primary market in Tugu Utara Tourism Village and Saung Sarongge Tourism Village consists mainly of those visitors who possess substantial spending power or individuals originating from regions with a high Regional Original Income (ROI) while purchasing power of tourism in Pusat Laut-Towale Tourism Village is still relatively low. It turns out that the ability to bring as many direct physical visits as visitors, amenities, and accessibility are substantially inferior, too. The conditions of Tugu Utara Tourism Village are coherent with the target of SDG 8: Decent work and economic growth; SDG 6 Clean water and sanitation. Saung Sarongge Tourism Village is associated with the target of SDG 17: Partnerships for the goals; SDG 2: Zero hunger; SDG 7: Affordable and clean energy. The conditions of Pusat Laut-Towale Tourism Village are mainly effort the target of SGD number 1: No poverty.

4.2 Socio-cultural performance measures

Figure 6 explains that the intermediate outcome helps establish the mission and rationale of outputs as an excellent precursor to constructing the end outcomes. This logic model points to intermediate outcome concerns with SDGs as end outcome items in the process. An ABC will feed all logic models. Fill out this intermediate outcome using a digital literacy pre-test and a post-test as a helpful non-verbal tool for writing a mission statement. To generate dialogue among capacity-building participants during the development of program outputs that correspond to each intermediate outcome, ask the following questions: What specific things can this village tourism management do to cause the desired change? What digital products and services platform should be provided? What is the actual workload to be handled?

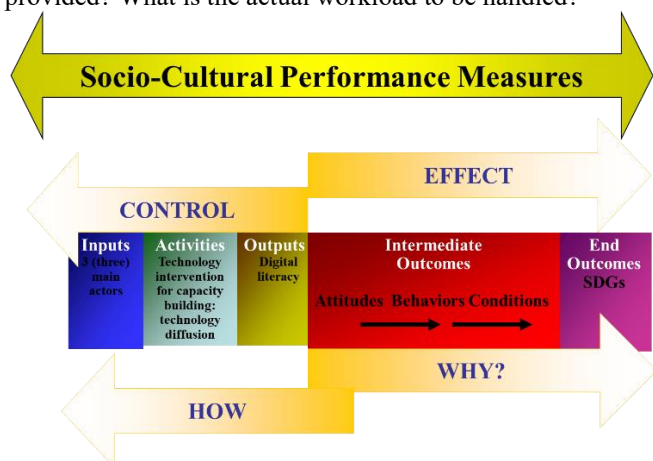


Figure 6. Mapping logic model for socio-cultural performance

Utilizing digital platforms and technological interventions for various parties involved in the Tugu Utara Tourism Village and Saung Sarongge Tourism Village has been much more felt than in the Pusat Laut-Towale Tourism Village. Capacity building also involves diffusion technology in the two places, inviting experts to discuss digital platforms. Donggala

Regency Communication and Information Agency (Diskominfo) and the Telecommunication and Information Accessibility Agency (BAKTI) are attempting to improve the network and infrastructure at Pusat Laut-Towale Tourism Village with the intent to enhance the awareness of digital literacy among those in tourism village management and the surrounding community [28]. Community Information Groups (KIM) are empowered to implement digitalization-based mentality shifts.

Socio-culturally, the attitudes of Saung Sarongge Tourism Village and Saung Sarongge Tourism Village are better digital literacy by using the pre/post-test of capacity building rather than Pusat Laut Tourism Village. The pursuit of behaviors in Tugu Utara Tourism Village and Saung Sarongge Tourism Village are mainly familiar with diffusion technology, while the Pusat Laut-Towale Tourism Village is attempting more technology to improve the network and surrounding infrastructure. The conditions of Tugu Utara Tourism Village are coherent with the target of SDG 9: Industri, innovation, and infrastructure. Saung Sarongge Tourism Village is associated with the target of SDG 4: Quality education. The conditions of Pusat Laut-Towale Tourism Village are mainly effort the target of SGD number 10: Reduced inequalities.

4.3 Environment performance measures

Figure 7 illustrates how the Logic Model ties everything together and delineates each environment's performance in achieving SDGs. As the control arrows indicate, the first step is determining the input, activities, and outputs and defining success in those areas. Working backward, accompanying how-oriented, the details of attitudes, behaviors, and conditions describe the intermediate outcomes of their achievement. Once the effect arrows of intermediate and desired end outcomes have been specified, each why-oriented in achieving SDGs must be determined.

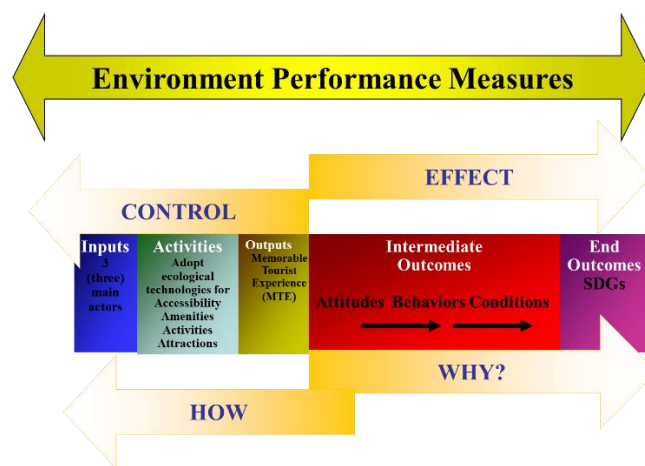


Figure 7. Mapping logic model for environmental performance

First, challenge it to consider the Memorable Tourist Experience (MTE) as the bottom-line output. The question for visitors is, "How will you know you have been so satisfied that you can charge with addressing your MTE?" Allocate a reasonable amount of time for visitor session participants to ponder this. Ask them to envision the point where the MTE problem has been eradicated. What that would look like is among the most intriguing things on this question list. Next,

what two to three pieces of evidence would be presented to the SDGs item to prove the activities' worth? Bring them in when village tourism management adopts ecological technologies for accessibility, amenities, activities, and attractions [29]. The above list of questions should guide the specification of intermediate outcomes.

The intermediate outcomes contain strategies. Strategies to measure changes in attitudes, behaviors, or conditions are required to achieve end outcomes. Competitive strategies and contracting deal with the decision to SDGs, and the various values plan indicates how ecological technology can assist in accomplishing SDGs. For each environmental performance of the tourism village, what end benefit is charged when delivering the SDGs?

Here, each tourism village focuses on three arms of ABC (attitude, behaviour, and condition) over time as outputs change or as the efficacy of activities evolves. Tugu Utara Tourism Village is a conservation area that must be maintained and protected. Therefore, environmental exploration includes lakes, suspension bridges, canoe boats, glamping, and hiking to the waterfall, which must be equipped with security systems and GIS equipment to ensure the sustainability of its long-term conservation function. Organic fertilizer production through waste treatment technology is an eco-friendly and sustainable approach to lowering organic waste while boosting the fertilizer grade to make it accessible to farmers.

Saung Sarongge Tourism Village has the status of a buffer zone for the management of the Cibodas Biosphere Reserve (CBC). There is an urgent need to implement suitable technology, such as the administration of biosphere reserve databases and the utilization of predictive modeling and climate change scenarios, to effectively plan for and adapt to environmental changes caused by earthquakes, floods, and landslides. Ecotourism is the primary approach to providing various educational vehicles for visitors, including sheep, rabbits, vegetable farming, and cottage industries that make soap, oil, and lemongrass. The use of chemical pesticides on crops harms the ecosystem, and hence, a technique (Integrated Pest Management/IPM) is required to mitigate this problem. Various technologies and methods of pest and disease control are carried out most sustainably, including monitoring, biological control, and a deep understanding of agricultural ecosystems.

The condition of the clean water supply in the Pusat Laut-Towale Tourism Village still needs to be improved. In addition to bringing in water from wells or natural sources, technological interventions for alternative water resources, such as seawater desalination, should be considered. Environmental exploration in the unique attractions offered by the tourism village, including coin-throwing attractions in the natural old well of the pusat laut (pusentasi), snorkeling underwater beauty on Karampuana Beach, and the historical relics of Bulava Mpongeo, and weaving sarongs must still pay attention to aesthetic values, ecological values, and biodiversity values. Moreover, women's inclusive value is essential because not all women in other tourism villages have weaving sarong skills.

Each tourism village's attitudes differ in aesthetic, ecological, biodiversity, and women-inclusive values. Each tourism village's behaviors depend on the commitment level to the Sustainable Development Goals (SDGs). Tugu Utara Tourism Village and Saung Sarongge Tourism Village are committed to activities and attractions, while in Pusat Laut-Towale Tourism Village, the amenities and accessibility are.

The conditions of Tugu Utara Tourism Village are coherent with the target of SDG 15: Life on land; SDG 13: Climate action. Saung Sarongge Tourism Village is associated with the target of SDG 12: Responsible consumption and production; SDG 11: Sustainable cities & communities. The conditions of Pusat Laut-Towale Tourism Village are mainly effort the target of SDG 5: Gender equality; SDG 14 Life below water.

5. CONCLUSIONS

The classic root causes of failure policy can often be traced back to several key issues, such as inadequate measures. Even when village-based tourism aims to implement Triple Bottom Line (TBL) principles, there are often vague, subjective, or inconsistent indicators in reporting outcomes, making it difficult to measure a village-based tourism's performance comprehensively. One of the primary criticisms of TBL is the absence of standardized metrics for measuring social and environmental outcomes. Without clear metrics, it is challenging to determine the success or evaluate the progress of the village-based tourism policy. This lack of clarity makes measuring and comparing TBL outcomes across village-based tourism complexes difficult. By learning from good alignment towards performance plans and understanding the factors contributing to success, village-based tourism participants can better support sustainable and impactful tourism development in villages. Technology interventions should be involved as an initiative factor to achieve success in village-based tourism performance. It is crucial to have clear, well-aligned plans, effective management practices, and firm performance measures using the Logic Model that provides meaningful insights into the effectiveness of tourism initiatives. However, greater attention to the Logic Model in developing SDGs measures was called for, as was the creation of performance plans to be addressed in tourism strategic plans. The Logic Model template details broad goals and helps plan, evaluate, manage, and communicate. It builds understanding and promotes consensus about what village-based tourism participants do. The Logic Model template shows the transition on how it will work to build buy-in and teamwork, which will result in an intermediate outcome. Intermediate outcomes target the "center of gravity" of a particular problem to cause a change in the direction of the end outcome. It measures the results of strategies deployed to achieve the end outcome. Intermediate outcomes evaluate toward end outcomes, assess the impact of strategies, and measure changes in attitudes, behaviors, or conditions required to achieve end outcomes.

Therefore, the key findings of these studies are the integration of micro-scale business participants for promotion, transaction, and bookkeeping in village-based tourism as the center of gravity in economic performance measure; capacity building of a digital platform for technology diffusion as the center of gravity in socio-cultural performance; and ecological technologies adoption as the center of gravity in environment performance measures. Thus, what wish for tourism policy-making so does it serve SDGs? When the measure indicator of the village-based tourism practices is not clearly defined, it can lead to confusion, inefficiency, wasted resources, and efforts that do not contribute to meaningful SDGs as the end outcomes. By understanding these criticisms and lessons learned, policymakers can better utilize the TBL framework to drive sustainable and balanced development, ensuring that

economic, social-cultural, and environmental goals are genuinely integrated and mutually reinforcing.

The limitation of this research finding is the need for more generalizability. With a limited number of case studies, it becomes challenging to generalize findings across different villages. Each village may have distinct characteristics, such as cultural practices, geographical features, and socio-economic conditions, that make it unique. This variability can limit the applicability of lessons learned from one village to others. Furthermore, future research should expand the number of case study sites. Research can provide a more comprehensive understanding of the factors influencing tourism development by including a more comprehensive range of villages in different geographic and cultural settings. It would help identify commonalities and unique aspects to consider in planning and execution.

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