

Acceleration of Environmental Sustainability in Tourism Village

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ABSTRACT

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The research aims to determine the factors causing the low achievement of environmental sustainability in tourist villages and accelerate it. This study uses a desk research method with online data and information search techniques, secondary sources, and other scientific publications. Meanwhile, the analysis technique used is a descriptive qualitative analysis technique, analogy, and comparison of several research results and other scientific publications related to environmental sustainability in tourism villages through the local wisdom approach and digital transformation. The research was conducted by interviewing several sources to get input on ecological sustainability standards in Tourism Villages. The result shows that the standards used to measure environmental sustainability in tourist villages can be used because of the global nature of the standards. Tourism Villages have local wisdom that has become part of the community's life. This local wisdom is very likely to have encouraged the tourism village community to behave environmentally friendly. Local wisdom becomes the focal point and main attraction of a tourist village that can be disseminated to villagers and tourists. The results of the study suggest the optimal way in which sustainable environmental development in the village can occur.

1. INTRODUCTION

Many villages that have transitioned from traditional farming settlements into tourism attractions to alleviate poverty are now experiencing ecological and social challenges that are jeopardizing their long-term viability [1]. One of the most important areas of the global economy is tourism. It is today regarded as a well-organized mechanism for boosting economic progress as well as the development of host countries [2].

Tourism is a phenomenon that, if correctly planned, can result in improved production, higher living standards, and increased welfare and employment for people due to a variety of elements such as labor, capital, and land [3]. Tourism is a multi-faceted activity with economic, social, cultural, and environmental components that spans traditional economic sectors. Even in rural sections of the country, tourism creates more job prospects for a wide range of job seekers, from unskilled to specialized [4].

Smart tourism is a new phrase that describes how tourism locations, industries, and travelers are becoming increasingly reliant on emerging types of ICT that allow enormous volumes of data to be translated into value offerings [5]. Tourism is also significantly involved in digital developments, which are increasingly being referred to as "Tourism 4.0" or "Smart Tourism" [6]. Because digital technology has disrupted the creative and cultural industries, arts, culture, and creativity organizations must rethink their business or operating models in order to modify their practices. Organizations must embrace methods that promote human and sustainable development since climate change has altered cultural attitudes and values

[7].

Tourism and the environment are closely related. A good quality, clean, comfortable, and beautiful environment is a substantial capital to attract tourists. Therefore, environmental damages in various forms such as pollution, declining water quality, waste problems, global warming, declining quality of natural resources, and many more are closely related to and affect tourism [8].

Although each attempt may appear to be a little step forward, when considering the size of international travel, the usage of cellphones and travel apps has the potential to lessen each traveler's environmental effect. For starters, eliminating the need to print boarding cards can help save money on printing paper. Similarly, hotels provide electronic records bookings, which are stored centrally in date order and warn the user as the date approaches. Smartphones can also give users access to electronic maps and guidebooks, reducing their reliance on paper once more. Although technological innovation moves at a breakneck pace, we can confidently assert that technology has the potential to lessen tourism's environmental impact for both work and pleasure [9].

Damage to the physical environment (e.g., floods in tourist destinations), weather disturbances that result in increasingly erratic seasons, affecting flowering/fruiting; disrupting the tour schedule; the threat of losing a tourist attraction (e.g., damage to coral reefs due to rising sea temperatures, and the extinction of certain species due to natural damage), and rising sea levels resulting in decreased sand space are all examples of the effects of environmental damage on tourism [10]. However, it must be understood that tourism is both a sufferer and a contributor to environmental destruction as a result of

global warming. If we look at tourism and the environment more closely, we can see why. Tourism is a complex industry with many different activities [11].

It is noted that tourism is responsible for 8% of the world's carbon emissions, resulted from aviation, lodging, transportation, and various other tourism activities. According to Gössling and Higham [12], Gössling [13], tourism has a significant impact on global warming. Therefore, the tourism industry is also involved in producing and implementing CO₂ emission reduction policies. The issue of low-carbon tourism has begun to be studied by many scientific communities [14]. Referring to this fact, as a country that makes tourism a leading sector, Indonesia should take corrective steps to improve the situation and strive to realize low-carbon tourism destinations. The first step to achieve this is to apply the principles of sustainable tourism consistently.

According to Romita [15] in the next twenty years tourism will grow strong and two thousand million Tourists will invade present and future tourist destinations. As a consequence, tourism creates an unexpected impact on the environment. In this context and an important role is played by "undetected tourism". This term is called unorganized tourism, which occurs directly between tourists and local society, a process which official studies and statistics have little to analyze. That undetected tourism in some western regions, e.g. in Southern Italy, socially and economy is more important than being organized. It generates hidden economic flow. Moreover, this kind of tourism causes serious damage to environment, with reduced quality of life.

Big data marketing technology can help travelers personalize more low-carbon itineraries and raise their environmental consciousness. Furthermore, big data-driven low-carbon smart tourist supply chains may have higher market potential. This marketing technology has the potential to disrupt existing tourism business models and pave the way for a lower-carbon, more sustainable, and smarter tourism supply chain in the future [16].

Tourism is an activity that directly involves the community and has a variety of local impacts; in fact, tourism is acknowledged as having an incredible energy trigger, causing local communities to go through a metamorphosis phase in numerous aspects [17].

The varied implications of tourism must be carefully considered because they can either be assets or liabilities for communities. People who live near tourist hotspots are exposed to a wide range of norms and behaviors as a result of the flood of visitors. Rural tourism, if not adequately managed, has the potential to degrade the destination's natural environment [18].

According to Lemy et al. [19] Indonesia has Sustainable Tourism Development Strategies (STDev), which initially consisted of three programs, which are Sustainable Tourism Destination (STD), Sustainable Tourism Observatories (STO), and Sustainable Tourism Certification (STC). Currently, Indonesia's Sustainable Development Strategies program is coupled with Sustainable Tourism Industry (STI) and Sustainable Tourism Marketing (STM). The implementation of STDev Indonesia is meant to drive the country to move towards sustainable tourism for its current and future development, as well as supporting the realization of Sustainable Development Goals (SDGs) through tourism sector. The application of sustainable tourism can trigger the realization of environmentally-friendly tourism because one of the main components measured in sustainable tourism is

environmental sustainability [20].

In terms of the sustainable tourism references used, Indonesia adopts and adapts the Global Sustainable Tourism Council's (GSTC) standards and criteria, which are outlined in the Minister of Tourism of the Republic of Indonesia's Regulation No. 14 of 2016 concerning Guidelines for Sustainable Tourism Destinations. After then, Indonesia's dedication and compliance was demonstrated by issuing a new Ministerial Regulation to Minister of Tourism and Creative Economy Regulation of the Republic of Indonesia Number 9 of 2021 about Guidelines for Sustainable Tourism Destinations. The Sustainable Tourism Certification (STC), which was announced in 2019, has been implemented in Indonesia with one destination and 16 Tourism Villages.

Tourism villages were chosen as one of the entities to be certified because they play an important part in implementing sustainable tourism, as this entity touches on many different elements. The GSTC verse two standards and criteria (<https://www.gstcouncil.org/gstc-criteria/gstc-destination-criteria/>), Tourism Village Guidelines from the Ministry of Villages of the Republic of Indonesia, and Tourism Village Guidelines from the Ministry of Tourism and Creative Economy of the Republic of Indonesia were adopted and adapted for Tourism Village certification. Furthermore, the norms and requirements in the tourism village take into account the distinctiveness of local wisdom.

All indicators used in the certification process include 174 indicators. For Tourism Village certification, there are adaptations to the indicators that also accommodate tourism village standards and criteria. Specifically, for the Sustainable Management Criteria, there are 58 indicators, the Social and Economic Sustainability Criteria with 47 indicators, Cultural Sustainability with 16 indicators, and Environmental Sustainability with 53 indicators. Based on the results of the first certification activities for the 16 tourism villages, the Environmental Sustainability Standards and Criteria have not yet been fully implemented, and not all of the existing criteria and indicators have been well understood by the tourism village managers.

Apart from the standards that cannot be applied due to the unique characteristics of certified tourism villages, the average achievement of environmental-related standards in the green category (full implementation) is only 56%. This data is not encouraging because many indicators have not been implemented. The data above shows the need for research to determine the factors causing the low achievement of environmental sustainability in tourism villages and accelerate it. Local wisdom passed down from generation to generation is the main attraction for rural tourism [21]. Existing local learning encourages village communities to maintain their culture and environment. A digital transformation approach needs to be taken to accelerate the process. Moreover, the Indonesian government is currently encouraging digital transformation by strengthening human resources and infrastructure, the internet, and data integration and interoperability. According to Belanche et al. [22] and Del Chiappa and Baggio [23] this is important because the opening of innovative technology in this century becomes a gateway to building intelligent destinations.

Referring to the fact, this research addresses the following questions: Are the criteria and standards appropriate to measure environmental sustainability in a tourism village? How is the current achievement of environmental sustainability? What is the role of the government in

implementing environmental sustainability in tourism village? What factors are needed to assist tourism village in implementing environmental sustainability? In addition, the approach used in this research for the solutions are the local wisdom approach and digital transformation in tourism village. The local wisdom was chosen because it is inseparable with tourism village development in Indonesia. Meanwhile, digital transformation is highly needed to be enforced in tourism village in order to assist them in adapting to the dynamics of the tourism industry. At the end, acceleration in environmental sustainability is expected to happen in tourism village.

For this reason, research was carried out on three of the 16 certified tourism villages. The results of this study are a model that Tourism Villages can use regarding the steps that must be taken to accelerate environmental sustainability. It is expected that through a tourism village that can implement environmental sustainability standards thoroughly and consistently, it will be the first step for Indonesia to become a tourism destination that is environmentally friendly, low in carbon and has a real positive impact on tourists and local village communities.

2. LITERATURE REVIEW

2.1 Village tourism

Village tourism is one of the most promising ways to encourage rural development [24, 25]. Village tourism can be promoted as the primary source of revenue, with the proceeds going toward rural socioeconomic development and infrastructure. It raises awareness about the need of preserving the environment, local culture, and heritage, as well as improving accessibility. Tourist villages have emerged as a new type of tourism in industrialized countries, allowing visitors to experience and enjoy a peaceful and healthy lifestyle. Village tourism is a type of tourism that promotes village life, arts, culture, and heritage while also enhancing the local environment and improving rural livelihoods [26].

Village Tourism is a rural region with various unique characteristics that make it a popular tourist destination. The

tourism village is an example of sustainable alternative tourism development [27].

Village tourism is one of the most significant segments of the tourism sector, as it is the driving force behind the village's economic growth and development by giving leadership opportunities based on the village's potential [28].

Village tourism is a type of tourism in which visitors stay in villages for relaxation, quiet, better health, and to learn about traditional knowledge. It contributes to the development of infrastructure facilities such as transportation, lodging, and institutions, as well as promoting local culture and products, increasing employment, and generating cash. Diversifying traditional agricultural activities has been found to be vital for the development of farm-based village tourism [29] which will boost rural economic development. Furthermore, good environmental quality can boost tourism [30].

2.2 Sustainable tourism

Sustainable tourism is also generally defined as all forms of tourism that seek to generate beneficial exchange relationships and provide a truly positive experience for all stakeholders [31, 32]. It aims to ensure a balance of interests, protect and enhance resources and, at the same time, meet the needs of all parties involved (current and future) [33].

Ecotourism involves traveling to relatively undisturbed natural areas with specific objects to study, admire, and enjoy the landscape and its wild plants and animals. Responsible tourism maintains benefits for local communities, minimizes negative social or environmental impacts, and helps local communities conserve fragile cultures and habitats or species. Geotourism is defined as tourism that sustains or enhances the geographical character of a place's environment, culture, aesthetics, heritage, and the well-being of its inhabitants While cultural tourism is tourism that travels to see places and experience authentic activities that represent stories and people from the past and the present. Now, Figure 1 illustrates the relationship between ecotourism, geotourism, responsible tourism, and cultural tourism with sustainable tourism [34] (see Figure 1).

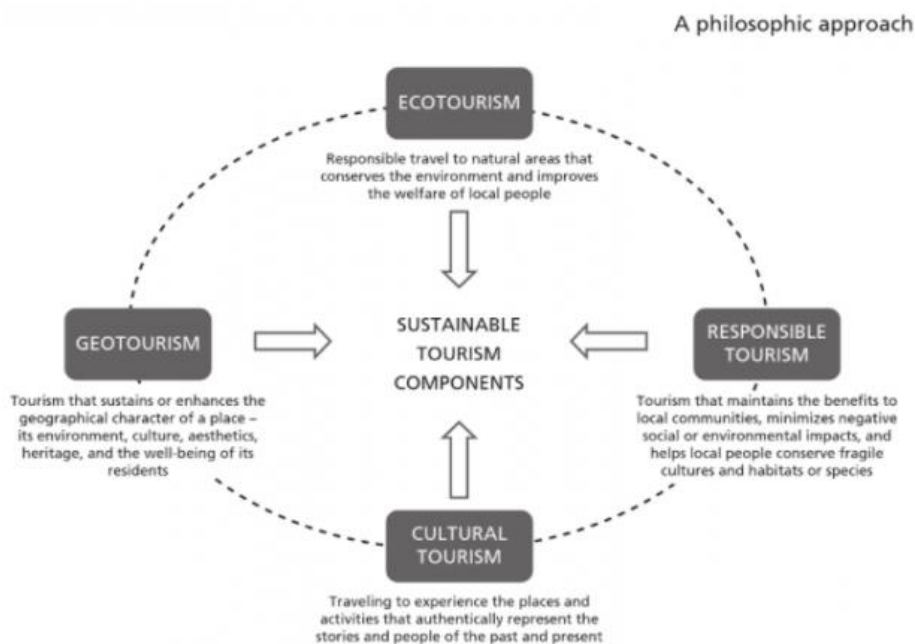


Figure 1. Sustainable tourism development strategy of Indonesia

According to Costa and Carvalho [35] sustainable tourism is a development model and not a type of tourism. This model relies on three aspects: economic profitability is significant but must be combined with ecosystem preservation and social justice, or balanced distribution of wealth.

The application of Sustainable Tourism for Development (STDev) can support the sustainable development of the region/region itself [36]. The concept of sustainable tourism that accommodates current and future tourism needs has an essential role in realizing three of the 17 SDG. Especially in decent work and economic growth (target 8), responsible consumption and production (target 12), and life under water (target 14) [37].

In 2007, Indonesia took the first steps toward sustainable tourism when it attended the Workshop on Sustainable Development Indicators for Tourism Destinations. The Ministerial Regulation No. 14 of 2016 concerning Guidelines for Tourism Destinations, which accepted worldwide standards from the Global Sustainable Tourism Council (GSTC), outlines the implementation of sustainable tourism. [19].

Sustainable tourism development (or STDev) is conceptualized and implemented in Indonesia through the establishment of three key programs: Sustainable Tourism Destination (STD), Sustainable Tourism Observatory (STO), and Sustainable Tourism Certification (STC) [38] (see Figure 2).

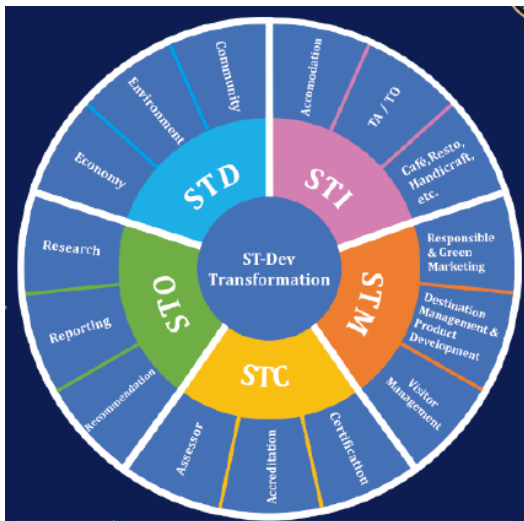


Figure 2. Sustainable tourism development in Indonesia

2.2.1 Sustainable tourism destinations (STD)

The strategy's first program is to set goals that incorporate the concept of sustainability into its development. The fulfillment of these objectives will be a measure of the strategy's success. The focus of the Indonesian Sustainable Tourism Destinations Program is on directing tourism through sustainable tourism governance patterns that can provide optimal economic benefits, intense community involvement, tourism's role in cultural preservation, and tourism's role in environmental conservation. There are three dimensions to sustainable tourism destinations, as shown in Figure 2: economy, community, and environment. Income and expanded economic employment capacity for community aspects, social welfare and empowerment of local facilitators and partners for community aspects, and climate change adaptation for environmental aspects are the important indicators.

2.2.2 Sustainable tourism observatory (STO)

STDev Indonesia's next strategy is to develop the Sustainable Tourism Observatory (STO). In order to contribute in the implementation of sustainable tourism principles, STOs have defined goals that must be completed. MCSTO (Center for Monitoring the Observatory of Sustainable Tourism) is a mechanism platform for monitoring and assessing economic, environmental, and socio-cultural impacts using systematic applications and data management methodologies. Figure 2 shows how research and monitoring, reporting, and suggestions are all taken into account. This is the most straightforward method of evaluating STO performance. An academic/research institution appoints the MCSTO to carry out these duties.

2.2.3 Sustainable tourism certification

The implementation of an Indonesian Sustainable Tourism Certification (STC) program is STDev's third plan. Each long-term goal has a process and a criterion for sustainable tourism certification. It seeks to examine and determine the quality status, standards, and sustainable quality based on set quality standards. Finally, as it is presented to the public and tourists, the certification will reflect the goal's excellent status in the framework of sustainable tourism. STC is implemented in Indonesia using three primary measures. The first step is to see if the certification procedure is appropriate. The accreditation body's readiness to certify is the second consideration. The evaluation recommendation to improve the destination's performance in sustainable tourism is the third component of the implementation. Each purpose must guide the certification procedure. It should be stressed, however, that accreditation should not be the end goal of a place when it comes to implementing sustainable tourism. It's a tool to help destinations put thoughts into reality so they can know what should and shouldn't be done. It may, of course, help all stakeholders change their attitudes and behaviors toward tourism growth [39].

To encourage tourism as a tool for sustainable development and ensure the implementation of the World Tourism Code of Ethics, Indonesia formed the Working Group for the Acceleration of Sustainable Tourism Development a name it as The National Tourism Ethics Committee. This committee involves the Ministry of Tourism, tourism business associations, tourism workers associations, consumer associations, other related ministries, representatives of NGOs, academics, and religious institutions. Its roles include disseminating the World Tourism Code of Ethics; promote the implementation of the World Tourism Code of Conduct; take an inventory, collecting, and communicating the principles of implementing the code of ethics; and coordinate with related institutions to supervise and act as counselors in the event of differences in interpretation of the implementation of the code of ethics [21].

2.2.4 Sustainable tourism industry

STDev's fourth strategy is the establishment of a Sustainable Tourism Industry (STI) program for Indonesia. The purpose of STI is to find out how important the Guidelines for Sustainable Tourism Industry Standards are as a reference in business operations (applying principles, criteria, indicators of sustainable tourism) so that they can improve the performance of the Tourism Business (Industry); Hotels, Restaurants, Home Stays, Tour Operators and other Businesses.

2.2.5 Sustainable tourism marketing

The fifth strategy of STDev is the establishment of an Indonesian Sustainable Tourism Marketing (STM) program. The goal of STM is to optimize management arrangements in order to strengthen the reputation of tourism destinations through the development of tourism products, sustainable production and consumption, and responsible marketing/promotion; and improvement of Destination governance orchestration (Visitors Management; Carrying Capacity) in accordance with the Sustainable Tourism principles/standard indicators.

One of the most important keys to the success and implementation of sustainable tourism development in a community is the support of stakeholders (for example, residents, entrepreneurs, and community leaders) [40].

By adhering to the concept of sustainable tourism, destinations seek to develop development strategies that meet multi-stakeholder goals. The management of all stakeholders through the STDev unit must be a more balanced and long-term goal, integrating environmental, social, cultural, and economic strategies.

The Pentahelix Model partnership is one of the tactics used by the Indonesian government to promote tourism growth. The Pentahelix model was created by Indonesia's tourism minister, Arief Yahya, and was included in the Minister of Tourism Regulation (Permen) No. 14 of 2016 concerning Guidelines for Sustainable Tourism Destinations. According to Arif Yahya, the pentahelix is a partnership of 5 (Five Elements) elements of tourism subjects or stakeholders: academician, business, community, government, and media [41].

Villages have an essential role in development. However, the village economy is still dominated by production activities in the agricultural sector (in a broad sense) which tends to have low productivity, is still running sluggishly and is less exciting in addition to several other challenges, such as limited employment opportunities, lack of facilities and infrastructure in rural areas, and the low level of community education. Responding to these challenges, the development of tourism activities in the village can be an instrument to improve the village economy by creating added value to the environmental, social, cultural, and economic assets of the village. The development of tourism activities in the village is expected to impact the villagers, both those who work in the agricultural sector, handicrafts, processed food/culinary, arts, and other productive sectors. This prompted several countries to start upgrading villages to support tourism.

Rural areas have natural resources which attract many visitors where natural resources are the main attraction. Although physical investment is seen as accelerating tourism development, the sustainability of tourism will not run well without the participation of the local community. Community-based tourism contributes to the government's plan to build jobs and eliminate poverty for the people involved. In addition, it can be seen as a way to help generate income for the community. The main idea is for communities to create projects that promote sustainable development and relationships between local communities and visitors [42, 43].

Developing a tourism village requires careful integrated planning. The village shows its role and function as a source of inspiration for environmental and cultural preservation. Village life can only improve economically and show progress in village development. However, the village still has to offer its role and function as a source of inspiration for environmental and cultural preservation and support the

balance of life and ecosystems through tourism activities, villages can provide places for learning, primarily environmental and cultural preservation [44]. According to [21], to develop a tourism village, several factors should be considered, such as good physical access and market access, the potential for effective partnership development, community motivation and enthusiasm, and the availability of essential public facilities.

According to Darmadi [45] cultural values, traditional ideas, and local knowledge are examples of local wisdom. Local wisdom is defined as knowledge gained through community experience, as well as the accumulation of local knowledge found in communities, communities, and individuals [46]. The local wisdom in a community is obtained through experience and initiation, and knowledge is passed down from generation to generation [47].

The existence of local wisdom in a community becomes an extraordinary force in the governance of a community, including being a driver for preserving the environment. Ardika [21] provides several examples of local wisdom in four indigenous Indonesian communities: Dayak Benuaq in East Kalimantan, Haruku Community in Maluku, Kajang Ammatoa Tribe in South Sulawesi, and Bali with the Tri Hita Karana concept. In these four communities, local wisdom is based on spiritual aspects where a belief in God encourages effective conservation of the natural environment.

Recently, digital technology has impacted people's lives [48, 49]. Various possibilities and opportunities triggered by technological advances bring cultural changes in multiple institutions and organizations to develop creative ways to adapt to digital transformation. Werthner et al. [50] underlined that digital disruption is closely related to digital infrastructure issues: individual, group/social, corporation/company, network/industry, and government/policy. The problem of digital infrastructure is something that slows down digital transformation.

In the tourism sector, digital transformation has changed the face of this industry. The tourism industry is transforming into a 'smart' sector, or in other words, into an innovative initiative that utilizes advanced technology in its activities. Due to this, the industry follows the paradigm of the industrial revolution 4.0. Digital transformation in the tourism industry will impact creation and innovation regarding tourists' values and experiences, various business sectors in tourism, and their stakeholders. This is in line with Barile et al. [51] who state that the service value ecosystem consists of various parties directly involved in creating value and travel experiences (tourists, residents, tourism service providers, companies), transportation, travel agency and so on); supporting service providers (telecommunication businesses, banks, payment services); various social media platforms (Facebook, Twitter, Instagram and so on); public companies that issue regulations, technology companies that support online reservations (Sabre, Amadeus, Galileo), tourism infrastructure (museums, national parks and so on); as well as various other businesses that are actually in sectors outside of tourism (health services and e-commerce) that support tourism activities.

According to Paola et al. [52], technology impacts the communication process. Technology makes communication faster, bidirectional, and adaptable to target specific audiences, and opens up third parties' evaluation opportunities. Furthermore, technology can also facilitate interactive relationships between providers and recipients, enabling recipients to voice their feedback directly to the information

provider. In tourism, this is needed considering that tourism services require smooth communication between stakeholders.

Pencarelli [6] stated that the most important thing is that it is not permissible to replace high touch with high tech in the tourism industry because tourism is a 'people industry.' Instead, a new tourism ecosystem built on digital transformation should always include smart tourism perspectives such as sustainability, circular economy, quality of life, and social values. Combining technological advances in tourism with a human touch will enhance the tourism experience and improve the competitive advantage of intelligent tourism destinations.

2.3 Previous research

Kumar et al. [53] Infrastructure development, increased environmental consciousness, local government and community support, government funding availability, and private sector participation are the major elements driving rural tourism development.

The relationship between tourism and the environment is interdependent. The atmosphere, nature based attraction, cultural-historical places and social conditions, are some factors affecting the motivation of tourists to travel. In contrast, the cleanliness of the environment and the stable climate will not exist without the practice of quality tourism. The more diverse and complex the natural resources are (it is recommended that these natural resources be preserved as much of their authenticity as possible, with properties very similar to their natural environment), the more attractive it is to tourism. The activities generated by them are more valuable and more beautiful [8]. According to Rasekhi and Mohammadi [54], tourism is a multidimensional economic activity that interacts with the environment.

On the one hand, environmental resources provide raw materials for tourism. On the other hand, tourism provides various negative and positive impacts (desired or unwanted) on the environment by creating multiple by-products. In recent years, climate change caused by environmental pollution, especially carbon emissions, has resulted in global warming and has adversely affected the survival of all living things on earth [55]. According to Zhang et al. [56], tourism industry has negatively affected the natural environment, including habitat destruction, excessive consumption of water and energy, and pollution of soil, water, and air. There is a consensus among the scientific community and tourism industry that tourism is a significant contributor of GHG (CO₂, methane, and nitrous oxide) emissions [57].

For these reasons, several stakeholders, including consumers, non-governmental organizations, and activist groups, have called on the hotel industry to address environmental issues. To prevent the effects of global warming from getting worse, the world now has 30 years to decarbonize its economy. This is a very significant challenge for tourism as a growth system. Much attention has been paid to different tourism sub-sectors such as aviation, accommodation, and activities to reduce emissions, primarily based on (future) technology [12]. According to Martínez García de Leaniz et al. [58] more and more countries are starting to actively develop low-carbon industries. As one of the new models in sustainable development, low-carbon tourism programs are dedicated to providing a high-quality travel experience while ensuring low carbon emissions by reducing pollution caused by transportation, accommodation, and shopping [56].

Low-carbon tourism plays a significant role in reducing carbon emissions and protecting the natural environment. The choice of low-carbon tourist destinations often involves many attributes or criteria and can be considered an issue in the appropriate multiple attribute group [7] Sustainable tourism is a concept that is often used in tourism development, planning, and management. The term is often associated with green tourism or ecotourism, ecosystem preservation, promotion, human well-being, inter-and intra-generational equity, and public participation in decision-making. Complex destination systems, sustainability, and sustainable development are key terms to remain competitive in the long run [59].

The sustainable tourism model merged as an alternative to the traditional neoclassical economic development model based on economic benefits without considering the negative social, cultural, and environmental impacts. Tourist destinations have traditionally grown spontaneously without planning. The consequence is the destruction of the natural and socio-cultural environment so that economic development leads to loss of competitiveness and opportunities to achieve sustainable services over time [60].

The most important thing according to Pencarelli [61] is that in the tourism industry, it is not permissible to replace high touch with high tech because tourism is a 'people industry'. Instead, a new tourism ecosystem built on digital transformation should always include smart tourism perspectives such as sustainability, circular economy, quality of life and social values. The combination of technological advances in tourism with a human touch will enhance the tourism experience and to increase the competitive advantage of smart tourism destinations.

Digital transformation in tourism requires an attraction that can relieve users' reluctance to take advantage of this technology. The design of the platform that is made must be attractive and easy to use so as to speed up the process of understanding the relevant users.

According to Buffa et al. [62] the question of sustainability and the search for a balance between the three pillars on which it is based have attracted worldwide attention, gradually affecting the development of all economic sectors, including tourism. The growing awareness of the positive relationship between tourism, welfare, and economic development at the territorial level has encouraged the academic community to seek new development models.

3. METHOD

This study uses a desk research method with online data and information search techniques, secondary sources, and other scientific publications [63]. Meanwhile, the analysis technique used is a descriptive qualitative analysis technique, analogy, and comparison of several research results and other scientific publications related to environmental sustainability in tourism villages through the local wisdom approach and digital transformation.

The research was conducted by interviewing several sources to get input on ecological sustainability standards in Tourism Villages. Sampling technique using purposive sampling technique of determining the research sample through a process of careful consideration. That way, the results will be representative. In general, purposive sampling is a non-probability sampling method. In qualitative social research, focus group discussion is a typical data collection

approach [64]. The resource persons from the tourism village managers are: Mr. Sugeng Handoko from Nglanggeran Tourism Village, Mt. South DIY Jogjakarta, Mr. Nengah Moneng from Penglipuran Tourism Village, Bali, Mr. Pahrul Azim from Billebante Tourism Village, West Nusa Tenggara. These three tourist villages were chosen to study because Nglanggeran Tourism Village is a tourism village based on natural attractions. It has reached 62% for environmental sustainability standards, the highest among other certified untouched attraction-based tourist villages. Penglipuran Tourism Village is a tourism village based on cultural attraction, and for ecological sustainability standards, it has reached 89%, the highest among other certified cultural attraction-based tourism villages. Billebante Tourism Village is a tourist village based on natural and manufactured attractions. It has reached 100% for environmental sustainability standards, the highest among other certified natural and manufactured tourist villages. Then, to sharpen the analysis of environmental sustainability standards, three expert resource persons were also interviewed, namely: Prof. Dr. Muhammad Baiquni, Gadjah Mada University, Jogjakarta (Member of the Indonesian Council for Sustainable Tourism, Actively fostering various Tourism Villages, ISTC (Indonesia Sustainable Tourism Council) Certification Body Auditor), Mr. Akhmad Saufi, SE., M. Bus., Ph.D., University of Mataram, West Nusa Tenggara (Member of the Indonesian Council for Sustainable Tourism, Secretary of UNRAM's Master of Management study program, ISTC (Indonesia Sustainable Tourism Council) Certification Body Auditor), Ir. Anak Agung Putu Agung Suryawan Wiranatha, MSc. Ph.D. (Member of the Indonesian Sustainable Tourism Council (ISTC), Postgraduate Lecturer at Udayana University, Sustainable Tourism Certification Institute Auditor). The interviewees were asked four questions: What do you think about the Environmental Sustainability Standards applied to Tourism Villages? What do you think about the achievement of Environmental Sustainability Standards in Tourism Villages? What has the government done to support Tourism Villages to meet Environmental Sustainability Standards? What resources are needed by tourism village managers (both internal and external) to achieve Environmental Sustainability Standards?

4. ANALYSIS AND FINDINGS

All tourism village managers thought that Environmental Sustainability Standards important because of the awareness that a sustainable environment must be pursued. Without a sustainable environment, the life and stability of tourism villages are also threatened. From the explanations of the resource persons who are managers of tourism villages, local wisdom is the basis for awareness for all components of tourism villages to maintain the environmental sustainability. The mindset of the villagers is strongly influenced by the existing local wisdom. This can also be seen in the behavior shown by members of the community. Currently, various actions are taken to preserve the environment, for example, management and conservation of Mount Nglanggeran, prohibition of irresponsible fishing and the use of biogas in Bilebante, and preservation of bamboo forests in Penglipuran which has received Proklam award.

There is a need for socialization and more detailed explanations and assistance to increase the tourism village

stakeholders' understanding on the sustainability standards. The answers from expert sources regarding this matter are: Environmental sustainability standards applied to tourism villages are correct but they require improvement, adjustment to the type of tourism village whose main attraction is different, contextualization with the destination tourism village to make it easier to understand, attention to local wisdom as an approach because tourism villages have their own traditional and embedded knowledge, understanding the limitations in terms of resources (example: human and financial), and assistance in the implementation.

The responses from expert sources regarding the current achievement of environmental sustainability standards is not optimal, although tourism villages can carry out these various criteria and indicators. The factors that influence the achievement of environmental sustainability standards are not yet optimal. Not all indicators are well understood by tourism villages, there needs to be a common understanding between the tourism village and the auditor on the existing criteria and indicators, The auditor must have the ability to understand what the tourism village has done in the field and accommodate it in the assessment—for example, questions related to climate change.

The auditors will also inform the tourism village about things that they have done, and actually already implementing environmental sustainability principles, such as: if they are no longer allowed to burn garbage, that is actually part of climate change mitigation, and burning debris will produce CO smoke. It can cause climate change, but if it is no longer allowed to burn waste, it must be processed in a composting manner. Furthermore, there is a need to contextualize the standard content with the conditions of the tourism village. It is necessary to look at the type of tourism village first so that the assessment indicators can be adjusted; there needs to be an internalization process first for tourism villages to understand the certification process and the standards used.

However, environmental sustainability standards require improvement. In terms of contextualization, tourism villages have local wisdom that has become part of the community's life. This local wisdom is very likely to have encouraged the tourism village community to behave environmentally friendly. Thus, in assessing the achievement of environmental sustainability standards, the first thing to explore is local wisdom that exists and is consistently implemented by tourism villages. From exploring the local wisdom, the auditor can map it to the indicators that have been implemented. The current achievement of sustainability standards is not optimal because tourism villages do not understand all of the standards.

These sustainability standards require broader and deeper socialization to improve the understanding of tourism villages. Not only socialization, but tourism villages also need assistance in implementing environmental sustainability standards. Some criteria are still considered new to tourism villages, such as energy conservation and greenhouse gas emissions. In addition, it is also necessary to contextualize standards with the conditions of tourism village attractions; for example, cultural-based tourism villages may not apply standards related to wildlife. Therefore, criteria and indicators related to nature cannot be used by the tourism village. The auditors who carry out the assessment must also understand well what each indicator means.

The role of the government in assisting the implementation of environmental sustainability in tourism villages has not been optimal and not consistent. In general, the government

comes with programs that are incidental and not necessarily related to environmental problems. Another thing about the government is that usually, the government tends to give the aid to well-known villages or reputable tourism villages.

Human resources and financial aid are some factors that have influence on environment sustainable tourism criteria implementation in tourism village. To support human resources, education and appropriate capacity-building programs are needed to answer problems in the field, such as training, workshops, pilot projects, demonstrations, and technology. The participants also mentioned the need to involve all components of the tourism village and, ultimately, financial support that facilitates village planning in terms of environmental sustainability. Financial aid can be used for purchasing equipment or building facilities related to the environment. This research's suggestion is to Elaborate on local wisdom that exists in a tourism village to accelerate environmental sustainability.

Local wisdom, which includes cultural values, traditional ideas, and local knowledge that is wise, full of wisdom, a good bargain, and contains noble values [45], comes from community experience and the accumulation of knowledge local knowledge found in the community. According to Chaiphar et al. [46] society and individuals are elaborated into several attributes: culture, customs, beliefs, habits, morals, and ethics. These various attributes can produce a value (value creation) for the tourism village related to environmental sustainability. A question related to value creation is how local wisdom is mapped against universal sustainability standards to make it easier to understand by tourism village stakeholders.

Local wisdom concept such as 'The forbidden river in the tourism village of Bilebante' are very numerous in various tourism villages in Indonesia. Therefore, value creation based on local wisdom is possible. Digital transformation is recommended to accelerate environmental sustainability. The digital transformation may bring up the local wisdom, because as the basis of life that applies to the village, it can be accessed easily on a digital platform. The digital platform that best suits the conditions of the tourism village can be chosen. The goal is that local wisdom is documented, presented in an attractive form, and increases the interest of tourism village stakeholders. Concerning environmental sustainability, The UX and UI are adapted. Digital transformation will create value related to the importance of the environment for tourism. This can be visualized better using a digital platform.

This value creation will be displayed digitally. A user interface (UI) for tourism stakeholders will be more tangible and more clearly visible on the digital platform used. For example, local wisdom related to the environment, which has only been conveyed orally and from generation to generation, can be presented in the form of stories supported by various interesting illustrations. When managers and villagers see this, it will create an impetus to preserve the environment. When encouragement is realized in the form of real action, the next thing that can happen is the emergence of appreciation. It can happen that the actions taken will be documented and uploaded back to various digital platforms, for example, social media. When this happens, it can be said that there has been a user experience (UX).

The following is a proposed model related to accelerating environmental sustainability in tourist villages through local wisdom and digital transformation and smart tourism: The proposed model for accelerating environmental sustainability through local wisdom approaches and digital transformation

and smart tourism still has to be tested and derived in a more practical and concrete form in future research (see Figure 3).

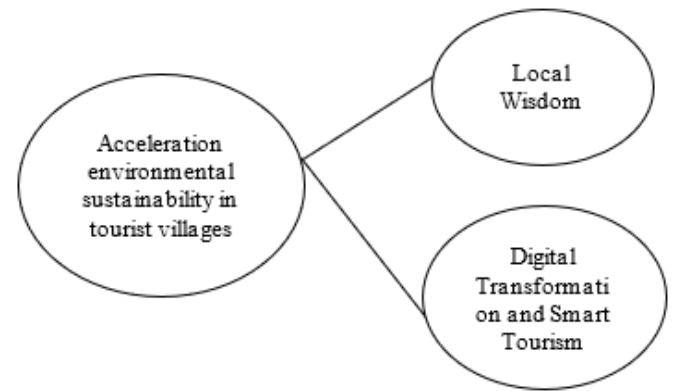


Figure 3. Proposed model

5. CONCLUSIONS

The standards used to measure environmental sustainability in tourism villages can be used because of the global nature of the standards. The standards adopted and adapted from the GSTC and accommodate some standards from tourism villages can be accepted by many parties as long as these standards are well understood. However, the current achievement still not optimum yet. The government has to increase their role to facilitate the tourism village to accelerate their environmental sustainability. Factors that influence tourism villages to implement environmental sustainability are reliable human resources and commitment to environmental sustainability, which can be regarded as champions or informal leaders of the tourism village.

To address the situation, it is recommended that the tourism village operator elaborates the local values they have in a deeper way into several attributes, namely: culture, customs, beliefs, habits, morals and ethics. These various attributes can generate value (value creation) for tourist villages is related to environmental sustainability. Value creation in question is how local wisdom is mapped to sustainable standards universal so that it is easier for stakeholders to understand tourist village. The next recommendation is a digital transformation in tourist villages to accelerate environmental sustainability. The digital transformation is pouring out existing local wisdom, both as the basis of applicable life on the village on a digital platform. The most suitable digital platform can be chosen with the conditions of the tourist village.

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